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## The presence of the genus *Ptilophyllum* in the Lower Jurassic flora of Romania

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**Abstract.** New statistics enumerates the published *Ptilophyllum* record of the Romanian Lower Jurassic flora. The genus *Ptilophyllum* is present in this fossil flora with the taxa *Ptilophyllum* cf. *acutifolium* Morris, *P. imbricatum* (Ettingshausen) Krasser, *P. rigidum* (Andrae) Krasser, *P. aff. jurassicum* Kimura & Ohana, *P. maculatum* Givulescu, *P. aninaensis* Czier, *P. cf. aninaensis* Czier, *P. acifolium* Givulescu, *P. curvatum* Givulescu, *P. grandis* Givulescu, *P. romanicum* Givulescu, *P. sp.* The validity of *Ptilophyllum acifolium* is questionable. *Ptilophyllum curvatum*, *P. grandis*, and *P. romanicum*, are invalid species. Nobody should confound *Ptilophyllum aninaensis* with *P. maculatum*. The so-called problem of priority created by Givulescu is visionary.

**Keywords.** Macroflora, Mesophytic, Romania.

### Introduction

*Ptilophyllum* is a common Bennettitalean genus of the Mesophytic. Referring to Seward (1917), Andrews (1970) notes in his catalogue the genotype *Ptilophyllum acutifolium* Morris 1840, a cycadophyte leaf from south of Charivar Range, India. Harris (1969) was who gave generic emended diagnosis, in his ample monograph on the Yorkshire Jurassic Flora. The complete name of the genus is *Ptilophyllum* Morris em. Harris.

The Lower Jurassic continental sequences in Romania yield rich *Ptilophyllum* material. Leaves attributed to this genus are known from Braşov County (Cristian, Holbav, Vulcan), Caraş-Severin County (Anina, Doman, Pietrele Albe), Gorj County (Crasna, Pleşa, Porcului valley, Vierzuroiu mine, Vierzuroiu valley), and from an unknown locality situated probably in the Southern Carpathians. The specimens discussed in this study originate from various stratigraphical units, defined by Mrazec (1898), Preda (1981), Bucur (1991), Stănoiu *et al.* (1997), Czier (1999, 2000a, 2000b).

Ettingshausen (1852), Andrae (1855), Štúr (1855, 1860a, 1860b), Hantken (1878), Römer (1879), Roth v. Telegd (1906), Krasser (1921), Thomas (1930), Semaka (1954, 1958, 1962a, 1963, 1970), Oarcea & Semaka (1962), Humml (1963), Zborea *et al.* (1966), Semaka *et al.* (1972), Givulescu & Farcaşiu (1989), Givulescu (1990, 1997), Popa (1994), Czier (1995, 2001a), refer to a considerable number of *Ptilophyllum* specimens. On the other hand, the only macroscopically described specimens and especially those noted in lists, which have no attached description or figuration, are suggestible to new determination. Before of such a major research, statistics should enumerate the whole *Ptilophyllum* record, taking into consideration all the published determinations and revisions. The first scope of this paper is to present such a statistics. The second aim is to elucidate the so-called „problem of priority” elaborated by Givulescu (1998a). The data below show that this problem is not of priority, nor of synonymy, but at the most one of microscopy.

### Cuticular studies

Despite of the relative abundance of the *Ptilophyllum* specimens in the Lower Jurassic flora of Romania, only four authors, namely Schenk (1867), Thomas (1930), Givulescu (1992b), Czier (1995), published major studies on the cuticles of such leaves. The old-fashioned studies of Schenk and Thomas, and the other papers of Givulescu, do not bring new arguments for the presence of the genus *Ptilophyllum*. Their cuticular preparations originate from unidentifiable hand specimens, or their published data may refer to other genera; many of their descriptions and figurations are copies from other works, moreover some of their species are invalid.

Givulescu (1998a) published a critical paper dealing with the two most important species of *Ptilophyllum* from the early Jurassic of Romania, one of them being *P. maculatum* Givulescu 1992, the other *P. aninaensis* Czier 1995. Based on some photos from the first plate of his paper, Givulescu concludes that ‘my species’ shows the same cuticular features as ‘his species’. Therefore, he

considers the names of the two species synonyms. Of course, in the context he presented, considering the rule of priority, he proposes the retention of the name *Ptilophyllum maculatum* Givulescu against *Ptilophyllum aninaensis* Czier.

There are many good reasons to reject Givulescu's arguments in this „problem of priority”. Above all, Givulescu (1998a) has confounded the photos of his own plate. From his explanations results, that all the figures of that plate are *P. aninaensis*, but this is false. Nobody can identify photocopies better than the photographer can. Photographers can easily identify unauthorized copies, even if they appear in obscure publications. Unfortunately, the author of the present paper is a photographer who has such a nasty experience. Givulescu's figures 1, 2, 4, from the mentioned plate, are identical with three photos from the doctorate thesis of Czier (1994). He published them without consent. It is sure, therefore, that only figures 1, 2, 4, from Givulescu's plate represent *P. aninaensis*. Figure 3 of the plate is identical with a photo, which Givulescu (1992a, plate II – fig. 1) has earlier published under the name *Ptilophyllum maculatum*. After so a confusion of the photos, it is not a miracle that in Givulescu's opinion the two species are the same.

Givulescu (1998a) presents a comparative table between *P. maculatum* and *P. aninaensis*. His table contains no comparison between the macroscopic characters of the two species, no data regarding the hypodermis and the cuticle of the rachis, not even comparable measurement data. The comparison he gives is incomplete. He compares only the upper and lower cuticles of the two species, and the stomata, in an effort to present them much resemblant. Despite all what he did, from his table result more differences than resemblances. Givulescu gave then a short discussion, arriving at his conclusion, that the two species are identical. He erroneously concluded, „The differences are due more to the manner of description, than to the nature of the material itself”. His „arguments” are few, and not significant. He tendentiously presented them in favour of his premeditated conclusion, to which he decided to arrive. An unacceptable fact in his paper is that he gives not scientific uniformity to the terms, not even to the descriptions from the table. Instead of this, he uses for the same specific feature old and new expressions of different meanings, and gives the same meaning to different terms (e.g. his permanent confusion between cuticle and epidermis). Moreover, as his paper looks, it seems insufficiently checked for errors. Would be his submitted manuscript thoroughly examined by competent reviewers, were much fewer spelling mistakes and unscientific misunderstandings in his publication.

To demonstrate that the two species are identical, Givulescu (1998a) alters the meaning of the diagnosis and description of *Ptilophyllum aninaensis*, writing, „Both formes have upper cuticles made up of star like cells”. Nevertheless,

the star-shaped, moreover papillate cells are characteristic only for *Ptilophyllum maculatum*. The diagnosis, description and figuration of *Ptilophyllum aninaensis* does not refer to „star like cells”, but to isodiametrical, squarish, and short-rectangular cells.

Givulescu (1998a, p. 83) argued „in order to compare and to find evidence”, that „Givulescu studied 14 species of *Ptilophyllum* of the palaeobotanical literature, Czier only studied three, to which he added *P. maculatum*.” What can I say about this statement? As about the only fourteen species of *Ptilophyllum* studied by Givulescu, this number is far not enough to create a new species. The only macroscopically and in light microscopy studied species *Ptilophyllum maculatum* is not one of the most relevant in the world. Scientists investigate the most relevant species also by means of modern methods and high quality instruments, like the Scanning Electron Microscope (SEM). Givulescu has worked only light microscopy, and the SEM researches intrigued him. The second part of his statement is ridiculous. Has somebody idea, which are those three species of *Ptilophyllum* to which he had thought? The author of this paper has not. Who may know better the number of species studied, than the author of the paper? If not a joke, the response must be nobody. The present author, when compared the new species *Ptilophyllum aninaensis*, published comparisons with *the most resemblant* species, to show that the new species differs even from those. International scientific journals have no tens of supplementary pages for useless comparisons with hundreds of very different species. Although there are numerous negatives in the ‘critical paper’ of Givulescu, wishing to maintain a good *memoriam*, no more examples of this brand will follow.

Prof. Givulescu realized later, that it is not ethical to ignore the opinion of a living author about such a problem of synonymy. He invited him to Cluj, to examine together the species *Ptilophyllum maculatum*, at the Geological-Palaeontological Chair of the „Babeş-Bolyai” University. The author has accepted the invitation. I saw with my own eyes his preparations under their old microscope, and said only a few words. He expected from my part to confirm the synonymy, but I could not. Then he came to the microscope, to show cuticular characters, in order to argue the pretended resemblance between the two species. However, the shown characters are not specific for both species. In fact, he insisted only regarding the upper cuticle, saying that it looks like that of the other species. „There are a lot of characters, which are particularly specific for each species”, said I, and continued in this manner: „The two species are distinct, and I do not change my mind. For example, the upper cuticle of *Ptilophyllum maculatum* indicates epidermal cells with extremely sinuous walls, and this confers a very characteristic feature to the species. *Ptilophyllum aninaensis* has different upper cuticle, but I had this already

published.” Givulescu looked once again in the microscope, and stated that „the upper epidermal cells” of his species are like some „very strongly coupled cog-wheels”. I found this essential remark very good in that verbal discussion, but I could not skip adding some homely remarks: „Unlike *Ptilophyllum aninaensis*, the cog-wheel-shaped epidermal cells of *P. maculatum* possessed each a strong papilla. There are differences also in the characters of the lower cuticle, as I had already noted them in a paper published at Stuttgart in 1995”. He began to smile, saying, the last problem is that the type specimens of both species are from the same locality. I remember well my response, „This is not a serious problem. If the characters show relevant differences, the species are distinct. The type locality matters little. Even if the specimens originate from the same stratigraphical or geographical unit, the species are different, if they present differences in the specific characters. This statement might be true not only concerning two species of the form-genus *Ptilophyllum*, but even in cases of resemblant biological species of which the spreading areas may overlap.”

In year 2004, Prof. Givulescu came to Oradea. He visited the town, then the Țării Crișurilor Museum. At the end of his visit, we sat on a bench in the park. He told, he is in the eighties, retires, and promises to comment published opinions anymore. He gave a photo (Pl. I), saying that he gives a free hand to publish it, ‘if I will, where I will, and when I will’. I accepted the gift with many thanks, and then we said a short good-bye. After three years, he deceased.

### Systematic palaeontology

Gymnospermatophyta  
Cycadopsida  
Bennettitales

***Ptilophyllum* Morris 1840 em. Harris 1969**

*Type species. Ptilophyllum acutifolium* Morris 1840

***Ptilophyllum* cf. *acutifolium* Morris 1840**

2001a *Ptilophyllum* cf. *acutifolium* Morris. Czies, p. 35

*Locality.* Anina.

*Lithostratigraphic unit.* The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic unit.* The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Age.* Hettangian *pro parte* – Sinemurian.

*Discussion.* Czier (2001a) has identified the species in the palaeobotanical collection of the Hungarian Natural History Museum, Budapest. The material is under study.

### ***Ptilophyllum imbricatum* (Ettingshausen 1852) Krasser 1921**

1. 1852 *Pterophyllum imbricatum* Ettingsh. Ettingshausen, p. 7, plate 1, fig. 1
2. 1855 *Zamites gracilis* Kurr. Andrae, p. 40, plate 11, figs. 4, 5
3. 1921 *Ptilophyllum imbricatum* (Ettingsh.). Krasser, p. 361
4. 1930 *Ptilophyllum imbricatum* (Ett.) Krass. Thomas, p. 390, text-figs. 1, 2
5. 1963 *Zamites gracilis* Kurr. Humml, p. 198
6. *non* 2001a *Ptilophyllum imbricatum* (Ettingshausen) Krasser. Czier, p. 35

*Locality.* Anina.

*Lithostratigraphic units.* 1, 3. The Steierdorf Formation – possibly the Dealul Budinic Conglomerate Member, but most probably the Valea Terezia Sandstone Member. 2, 4. Most probably the Steierdorf Formation, but possibly the Valea Sodol Marl Member of the Dealul Zânei Marl Formation. 5, 6. The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic units.* 1, 3. The *Clathropteris meniscioides* Biozone – most probably the *Banatozamites chlamydostomus* Subzone. 2, 4. Most probably the *Clathropteris meniscioides* Biozone or the *Carpolithes liasinus* Biozone. 5, 6. The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Ages.* 1, 3. Hettangian - Sinemurian. 2, 4. Hettangian - Toarcian. 5, 6. Hettangian *pro parte* - Sinemurian.

*Discussions.* 1. Based on a macroscopical study of „a cycadacean leaf” from the „arenaceo formationis Lias ad Steierdorf Banati”, Ettingshausen (1852) has described and figured a new species, which he named *Pterophyllum imbricatum*. Andrae (1855) has not accepted this species, and placed the material in other genus, as *Zamites gracilis* Kurr. Although Langer (1947), Semaka (1954, 1957, 1962a), Givulescu (1960, 1989a), Jongmans & Dijkstra (1965) cite the name *Zamites gracilis* Kurr, it must be remarked that the revision of Andrae is unacceptable, because the characters of the specimen do not allow assignment to the genus *Zamites*. Schenk (1867) maintains Ettingshausen's species *Pterophyllum imbricatum*, and gives a cuticular description, but there is no pro or

contra evidence that he has studied the original material of Ettingshausen or not. Štúr (1871) and Hantken (1878) cite the material, under the name *Pterophyllum imbricatum* Ettingshausen. Schimper (1872) maintained the species, but placed it in his own genus *Ctenophyllum*. Fontaine (1883) agreed this assignment, and accepted the combination *Ctenophyllum imbricatum* (Ettingshausen) Schimper. Krasser (1921) had other opinion. He revised the old determinations, and placed the species in genus *Ptilophyllum*. The combination *Ptilophyllum imbricatum* (Ettingshausen) Krasser is largely accepted since Thomas (1930) also gave a cuticular description. There is, however, a major problem with the description of Thomas: it almost surely does not refer to the material on which Ettingshausen has created the species. Although the combination is accepted by Givulescu (1989a), and cited by Czier (1999, 2000c), it would be advisable to restudy the material. A very fortunate event should happen to identify it, because its present keeping place, as well as its keeper, is unknown.

2. Andrae (1855) has described and figured new hand specimens from „Steierdorf Banati”, under the name *Zamites gracilis* Kurr. He has not noted how many specimens of this species he has studied. His plate 11, figures 4 and 5, shows two rock samples, each of them bearing one leaf fragment. There were thus probably two specimens. Schimper (1872) has not accepted the determination, and has attributed the material to *Ctenophyllum imbricatum*. Fontaine (1883) remarked that the specimens are like the plant of Ettingshausen (i.e. *Pterophyllum imbricatum*), but he cited the material as *Zamites gracilis*. He has not accepted the assignment of the material to any genus other than *Zamites*, and has maintained the determination of Andrae. Langer (1947), Semaka (1954, 1957, 1962a), Givulescu (1960), Jongmans & Dijkstra (1965) also cite the material under the original name *Zamites gracilis* Kurr, though the species was earlier revised by Schenk (1867), as a synonym of *Pterophyllum imbricatum*. Krasser (1921) was who assigned the material to *Ptilophyllum imbricatum*. It is cited under this name, by Semaka (1965), Givulescu (1989a), Givulescu & Czier (1990), and by Czier (1999, 2000c).

3. Krasser (1921) has recorded from the „lower Liassic of Steierdorf” new material. He has not mentioned the number of the specimens; therefore, there was at least one specimen. Givulescu (1989a), Givulescu & Czier (1990), and Czier (1999), cite it *Ptilophyllum imbricatum* (Ettingshausen) Krasser.

4. Thomas (1930) gave a very short and inconclusive macroscopic description and a good cuticular description for a *Ptilophyllum imbricatum* specimen originating from the „Liassic of Steierdorf”. The cuticle preparation has been made earlier by Prof. Robert Zeiller. Thomas noted himself that the specimen from which the cuticle preparation originate „could not be discovered”. He was able to figure



only the cuticles, not the leaf. This implicitly indicates the impossibility of studying the material even at that time. The determination is still accepted by Czier (1999, 2000c), but a general revision of the species nevertheless is necessary. Not just in order to make comparisons with the meantime appeared literature, but also because Thomas affirmed, „the specimen from which Zeiller’s preparations were made came from the Lias of Steierdorf, and was closely similar in external form to some examples of *Ptilophyllum pecten* (Phill.) from the Oolites of Yorkshire.” It is unknown, the original specimen of Thomas still exists, or not, and in the improbable case if it exists where could it be. At the beginning of the 20<sup>th</sup> Century, it was kept probably at „École des Mines” Paris, but this information is unsure, because Thomas added, „There were, however, certain difficulties which detract from the value of some of the observations given below. At the time when the work was done, Prof. Zeiller was confined to his room by the illness, which terminated fatally, and I had no means of discovering the specimens from which the cuticle preparations had been made. Several specimens were found in the collections of the Ecole des Mines, which bore the same names and localities as the preparations, and which were almost certainly the examples from which the preparations had been derived, but the sources of other material could not be discovered, and we have to rely on the labels which the slides bore.”

5. Humml (1963) enclosed in his catalogue the name *Zamites gracilis* Kurr for a specimen collected from Ponor shaft at Anina. Czier (1998) nomenclaturally assigns it to *Ptilophyllum imbricatum* (Ettingshausen) Krasser. Czier (1999) cites it under this name, however, the study of the material continues. The analysis of the macro- and microscopic features will clarify many questions. In this moment, nothing sure is to be communicating, because the material might belong to *Ptilophyllum*, *Zamites*, or perhaps to *Otozamites*. According to Gothan (1914), *Zamites gracilis* Kurr 1845 is similar to *Otozamites brevifolius* F. Braun in Münster 1843. According to Harris (1961), *Otozamites brevifolius* is a possible synonym of *Otozamites bechei*, but for the sure determination of the specimens, cuticular analysis is necessary. According to Menéndez (1966), *Otozamites bechei* is a synonym of *Otozamites obtusus* (Lindley & Hutton 1834) Brongniart 1849. Andrews (1970) stipulates *Otozamites obtusus* type species for the genus *Otozamites*. Therefore, the Anina specimen can be even a reliable *Otozamites*.

6. Owing to the study of some *Ptilophyllum imbricatum* leaves and stems identified by Czier (2001a) in the palaeobotanical collection of the Hungarian Natural History Museum, Budapest, they belong to other genera. The leaves belong to the new species *Banatozamites calvus* Czier (2009), and the stems to *Bucklandia aninaensis* Czier (2009).



***Ptilophyllum rigidum* (Andrae 1855) Krasser 1921**

1. 1855 *Pterophyllum rigidum* And. Andrae, p. 42, plate 11, fig. 1
2. 1855 *Pterophyllum (Divonites) rigidum* Andrae. Štúr, p. 345
3. 1860a *Pterophyllum (Dioonites) rigidum* Andrae. Štúr, p. 58 (*partim*)
4. 1860b *Pterophyllum rigidum* Goeppert. Štúr, p. 58
5. 1878 *Pterophyllum rigidum*. Hantken, p. 69
6. 1878 *Pterophyllum rigidum*. Hantken, p. 71 (spelling error for *rigidum*)
7. 1878 *Pterophyllum rigidum*. Hantken, p. 72
8. 1879 *Pterophyllum rigidum*. Römer, p. 54 (spelling error for *Pterophyllum*)
9. 1930 *Ptilophyllum rigidum* (Andrae) Krass. Thomas, p. 392, text-figs. 3, 4
10. 1954 *Pterophyllum rigidum* Göp. Semaka, p. 847, figs. 25 - 30
11. 1958 *Pterophyllum rigidum* Andrae. Semaka, p. 409, tab. 1 (*partim*)
12. 1958 *Pterophyllum rigidum* Andrae. Semaka, p. 411, tab. 2
13. 1962 *Pterophyllum rigidum* Andrae. Oarcea & Semaka, p. 241 (*pro parte*)
14. 1962 *Pterophyllum rigidum* Andrae. Oarcea & Semaka, p. 241 (*pro parte*)
15. 1962 *Pterophyllum rigidum* Andrae. Oarcea & Semaka, p. 241 (*pro parte*)
16. 1963 *Ptilophyllum rigidum* (Andrae) Krasser. Semaka, p. 166, 169, tab. 1
17. 1963 *Ptilophyllum rigidum* (Andrae) Krasser. Humml, p. 196, 197
18. 1966 *Ptilophyllum rigidum* (Andrae) Krasser. Zborea *et al.*, p. 49
19. 1972 *Pterophyllum rigidum* Andrae. Semaka *et al.*, p. 436
20. 1972 *Ptilophyllum rigidum* (Andrae) Krasser. Semaka *et al.*, p. 439, tab. 1 (*pro parte*)
21. 1972 *Ptilophyllum rigidum* (Andrae) Krasser. Semaka *et al.*, p. 439, tab. 1 (*pro parte*)
22. 1972 *Ptilophyllum rigidum* (Andrae) Krasser. Semaka *et al.*, p. 439, tab. 1 (*pro parte*)

*Localities.* 1, 5, 6, 7, 9, 13, 14, 17. Anina. 2, 4, 10. Holbav. 3. Cristian. 8, 11. Vulcan. 12, 15. Doman. 16. Pleșa. 18, 22. Crasna. 19. Porcului valley. 20. Viezuroiu valley. 21. Viezuroiu mine.

*Lithostratigraphic units.* 1, 12, 13. The Valea Terezia Sandstone Member of the Steierdorf Formation. 2, 4, 8, 10, 11. The Vulcan Sandstone Member of the Codlea-Vulcan Formation. 3. The Valea Schneebrich Sandstone Member of the Cristian Formation. 5. The Dealul Zânei Marl Formation. 6, 7. The Valea Sodal Marl Member of the Dealul Zânei Marl Formation. 9. Most probably the Steierdorf Formation, but possibly the Valea Sodal Marl Member of the Dealul Zânei Marl Formation. 14, 15, 17. The Steierdorf Formation – possibly the Dealul Budinic Conglomerate Member, but most probably the Valea Terezia Sandstone Member. 16, 19, 20, 21. The Schela Formation (Mrazec 1898, *sensu* Preda 1981). 18, 22. The Baia de Aramă Formation.

*Biostratigraphic units.* 1, 2, 4, 8, 10, 11, 12, 13. The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone. 3. The *Pterophyllum marginatum* Biozone. 5, 6, 7. Undefined. 9. Most probably the *Clathropteris meniscioides* Biozone or the *Carpolithes liasinus* Biozone. 14, 15, 17. The *Clathropteris meniscioides* Biozone – most probably the *Banatozamites chlamydostomus* Subzone. 16, 18, 19, 20, 21, 22. The *Clathropteris meniscioides* Biozone.

*Ages.* 1, 2, 4, 8, 10, 11, 12, 13. Hettangian *pro parte* – Sinemurian. 3. Sinemurian. 5. Aalenian. 6, 7. Toarcian. 9. Hettangian – Toarcian. 14, 15, 16, 17, 19, 20, 21. Hettangian – Sinemurian. 18, 22. Sinemurian *pro parte*.

*Discussions.* 1. Andrae (1855) has described and figured a new species from „Steierdorf im Banate”, naming it *Pterophyllum rigidum*. He has not mentioned the number of the specimens. It was, however, much probably just one, eventually were two or three, because the pinnae fragments presented on fig. 1 of Andrae's plate 11 seem to belong to three leaves, likely belonging to the same plant. Roth v. Telegd (1906), Codarcea (1940), Oncescu (1951, 1957, 1965), Semaka (1954, 1957, 1962a, 1962b), Răileanu *et al.* (1957, 1964a, 1964b), Givulescu (1960), Năstăseanu (1964, 1984), Boersma & Broekmeyer (1982), Dijkstra & Van Amerom (1985), Bițoiianu (1987), Mutihac (1990), cite in their lists the species, as *Pterophyllum rigidum* Andrae, and/or *Pterophyllum rigidum* Goeppert. Schenk (in: Zittel 1890) has not accepted Andrae's species, and considered the material belonging to *Dioonites cf. pennaeformis*.

Langer (1947) agreed Schenk's opinion, although Krasser (1921) placed earlier Andrae's species in the genus *Ptilophyllum*. Givulescu (1975) exactly repeats the description and figuration from the monograph of Andrae, and cites the old determination *Pterophyllum rigidum* Andrae. The combination *Ptilophyllum rigidum* (Andrae) Krasser is accepted and cited by Thomas (1930), later also by Semaka (1965), Jongmans & Dijkstra (1968), Petrescu & Dragastan (1981), Givulescu (1989a), Givulescu & Czier (1990), Czier (1995, 1999, 2000c, 2001a). It may be still accepted as somewhat useful, but in the absence of a cuticular study, it is difficult to say if the specimen indeed is a *Ptilophyllum* or not. Nobody knows where it is; therefore, no cuticular study is possible. The assignment of the specimen and of the species to *Ptilophyllum* may be equally contested. The emended diagnosis of the genus stipulates also cuticular characters of the leaf, but Andrae has only macroscopically described and figured the type material.

2. Štúr (1855) has recorded from the 'coal-bearing Lias formation of Hollbach' a fossil flora assemblage, assigning the most frequent appearing specimens to *Pterophyllum (Dioonites) rigidum*. Štúr (1860b) gave later a description combined

with a very short discussion. Štúr (1872) notes the names of the collectors, Fr. v. Hauer and Ferd. v. Richthofen, but not the name of the keeper too. He publishes no figures or photos showing the specimens. Hantken (1878), Herbich (1878), and later Mutihac (1990), still cite the name *Pterophyllum* (*Dioonites*) *rigidum*, or simply *Pterophyllum rigidum*. Krasser (1921) assigns the specimens to the genus *Ptilophyllum*. Semaka (1967), Givulescu (1992c), Cziesler (2000c), cite the material under the name *Ptilophyllum rigidum* (Andrae) Krasser. However, in the absence of a cuticular study, any assignment to the genus *Ptilophyllum* is unsure.

3. Štúr (1860a) has shortly described a *Pterophyllum* (*Dioonites*) *rigidum* specimen from the 'Liassic of Neustadt near Kronstadt'. According to Štúr (1872), Prof. Meschendorfer has collected the specimen from fine granular sandstones. Štúr wrote nothing regarding the repository, thus it is not known where was kept the material, and where is now. Hantken (1878), and Herbich (1878), cite it as *Pterophyllum rigidum* Andrae. Krasser (1921) nomenclaturally revised the material, when he placed the species in *Ptilophyllum*. Semaka (1965, 1967), Petrescu & Dragastan (1981), Givulescu (1992c), Cziesler (2000c), cite the material under the name *Ptilophyllum rigidum* (Andrae) Krasser. The specimen is not figured. Nothing is known about its cuticle, so the assignment to *Ptilophyllum* may be contested.

4. Štúr (1860b) discovered at Holbav new material of *Pterophyllum rigidum*, and enclosed this name in a list of the species. Semaka (1962c), Mutihac (1990), Givulescu (1992c), cite the determination under the name *Pterophyllum rigidum* Goeppert. Semaka (1967) assigns the material to *Ptilophyllum rigidum* (Andrae) Krasser. Mutihac (1974) cites this latter name. The repository and the number of the specimens are unknown. According to Semaka (1967), the material originates from the „middle horizon” of the coal- and fireclay-bearing complex, but the exact positioning in the stratigraphical column of the fossiliferous sampling points only scarcely, in few cases is possible. A good part of the material originates from an outcrop at Holbav. A whole plus a half century has passed from the collecting, but nobody has described or figured the material. I appreciate the memory and the work of the eminent scientist Dionýs Rudolf Josef Štúr, but the generic assignment in this case cannot be sure.

5. Hantken (1878) has recorded in his monograph *Pterophyllum rigidum*, collected in the Anina Shaft, from marls found at 146 meter depth. The record in fact is a citation of an unknown manuscript, in which Štúr determined the fossils, and distinguished several fossiliferous horizons. The Anina Shaft has begun on the 9<sup>th</sup> April 1874. In 1877, the depth reached was 303 meter. The collecting interval is therefore 1874-1877, and the collecting year almost surely 1875 or 1876. The lithological data and the collected fossils were carefully noted in the

mining statistics. Hantken places the horizon with *Pterophyllum rigidum* in „the lower oolitic”, with *Ammonites munchisonae*, *Pecten demissus*, *Inoceramus amygdaloides*, and *Zamites barrei*. Semaka (1962d) argues that these are Upper Aalenian deposits, containing *Ludwigia munchisonae*, *Entolium demissus*, *Entolium gingensis*, *Inoceramus amygdaloides*, and *Rhyncholites* sp. He considers the material belonging to *Ptilophyllum rigidum* (Andrae) Krasser.

Hantken visited Anina in 1877, and examined the collection of rocks and fossils kept there, but published no data concerning the number of the specimens. It is unknown where the material is. Only a palaeobotanical study might confirm or infirm a sure generic attribution. However, to be able doing such a study, the material should be identified.

6. Hantken (1878) mentioned the presence of *Pterophyllum rigidum* also in the micaceous marls collected in the main shaft Anina at 222 meter depth. This is, however, just a citation of the same, supposed manuscript of Štúr. The material has been collected between 1874 and 1877, almost surely in 1876. Hantken placed the horizon with this new appearance of *Pterophyllum rigidum* in „the lowermost level of the lower oolitic”, with *Neaera Kudernatschi*. According to Semaka (1962d), it belongs to an assemblage of Toarcian deposits, consisting of very fine grey marls and calcareous marls with numerous slightly sandy or leafy intercalations, containing *Ludwigia munchisonae*, *Neaera kudernatschi*, *Cucullea cancellata*, *Posidonia opalina*, and a questionable *Cardium striatulum*. Semaka has nomenclaturally revised the material under the name *Ptilophyllum rigidum* (Andrae) Krasser. However, the material is lost, if not, the keeper is unknown.

7. Hantken (1878) notes over again the presence of *Pterophyllum rigidum* in the Anina Shaft, now in leafy, sandy, bituminous marls, collected from 289 meter depth. The mentioned manuscript of Štúr constitutes the base of this information too. The collecting interval is 1874-1877, and the collecting year almost surely 1877. The horizon established by Hantken for this depth was the same „lowermost level of the lower oolitic”, of which the age, according to Semaka (1962d), is Toarcian. The data regarding the determination, nomenclatural revision, keeper, are the same as in the previous two cases.

8. Römer (1879) recorded three *Pterophyllum rigidum* specimens from the coal-exploration pit „Concordia” at Vulcan (Wolkendorf). He added no description or figuration to his determination. The material originates from ‘Liassic deposits developed in Gresten facies’. Semaka (1954, 1957), and Bițoiianu (1987), cite Römer’s determination. Semaka (1962a) cites it as *Pterophyllum rigidum* Goeppert, but Givulescu (1992c) as *P. (Dioonites) rigidum* Andrae. Givulescu (1992c) nomenclaturally revises the material, attributing it to *Ptilophyllum rigidum* (Andrae) Krasser.

Cuticular study could not be possible, even if the material would be available, because, according to Römer, only some impressions are preserved. Julius Römer has collected the material himself, but he has not mentioned a keeping place. He has not mentioned the collecting date, but from his paper results that the mining activity has begun in 1875. Because he mentions the material in his paper published in 1879, for the collecting period results the interval 1875-1879. According to Semaka (1957), in 1879 Römer was the keeper of the material. Deposited later perhaps in the „Burzenländer Naturhistorisches Museum” from Braşov (Kronstadt), its actual keeping place is unknown. Owing to all these circumstances, the material should be at the best considered lost, and the attribution to the genus *Ptilophyllum* questioned.

9. Thomas (1930) has published a very short, inconclusive macroscopical description, and a controversial cuticular description and figuration of a so-called *Ptilophyllum rigidum* from the 'Lias of Steierdorf'. The specimen, from which the cuticle preparation originates, was one of those kept at that time in Zeiller's collection, at Paris. Thomas gives no macroscopical figuration, so the identification of the specimen, even if it could be found somewhere, is impossible. It might resemble the specimen of Andrae, but there is no evidence to sustain this supposition. Thomas has noted, „Prof. Zeiller gave Schimper's name of *Dioonites rigidus* to several specimens from the Lias of Steierdorf which seem identical with those described by Andrae and which have been subsequently transferred by Krasser to genus *Ptilophyllum*.” No published data exist regarding the collecting year of the material, the collector name, and the actual repository.

The cuticular description and figuration of Thomas is the only one ever given for *Ptilophyllum rigidum*. However, his description does not refer to the original material on which Andrae has created the species, and is dubious to what kind of specimens refers in fact. Although the determination of Thomas is cited by Petrescu & Dragastan (1981), and by Czier (1995, 2000c), it must firmly stated, that *Ptilophyllum rigidum* (Andrae) Krasser is a species known only by macroscopical characters.

10. Semaka (1954) has macroscopically described and figured under the name *Pterophyllum rigidum* Göppert seven specimens from the 'Liassic in Gresten facies' deposits of Holbav. Alexandru Semaka collected the material between the years 1952 and 1953, from the middle of the village, where the sandstones above the coals appeared in a ditch. He deposited it in the palaeobotanical collection of the Geological Institute from Bucharest, but published no inventory numbers. Semaka (1956, 1957, 1962a, 1962c), Givulescu (1960, 1966), and Biţoianu (1987), cite the determination. Semaka (1958, 1961) revises without explanation his own determination, as *Pterophyllum rigidum* Andrae. After a while, Semaka

(1967) nomenclaturally revises the material, attributing it to *Ptilophyllum rigidum* (Andrae) Krasser. Mutihac (1974), Givulescu (1992c), Czier (2000c), cite it under this name. Finally, Givulescu (1992c) gives a nomenclatural and taxonomical revision. He attributes without explanation the material to the genus *Pterophyllum*, as *Pterophyllum (Dioonites) rigidum* Andrae. A thorough restudy of the material could probably decide this controversial generic assignment.

11. Semaka (1958) encloses in a table the name *Pterophyllum rigidum* Andrae, referring to some specimens that he collected between 1951 and 1954 from „Concordia”. Like in the previous case, Semaka (1967) nomenclaturally revises the material. Mutihac (1974) cites the correct name *Ptilophyllum rigidum* (Andrae) Krasser. Givulescu (1992c) notwithstanding revises the whole flora. By reason of something, he changes back the generic attribution, referring to the material under the name *Pterophyllum (Dioonites) rigidum* Andrae. Alexandru Semaka has deposited the material at the Geological Institute, Bucharest. Somebody should identify the specimens, and subsequently describe them. This might be a hard work, because Semaka published no inventory numbers.

12. Semaka (1958) mentions in his table *Pterophyllum rigidum* Andrae, also from Doman. Givulescu (1960) and Semaka (1961) cite this determination. Next year, Semaka (1962b) cites his own determination as *Pterophyllum rigidum* Goeppert. On the next pages of the same paper, Semaka gives a macroscopical description. In the description, however, he uses the name *Pterophyllum rigidum* Andrae. From the totally seven specimens, he figures only four. In other paper, Semaka (1962a) cites again *Pterophyllum rigidum* Goeppert. *Pterophyllum rigidum* Goeppert and *Pterophyllum rigidum* Andrae are different species, but Semaka frequently confounded them. Răileanu *et al.* (1964a), Preda *et al.* (1985), followed him by citing the name *Pterophyllum rigidum* Goeppert. Givulescu (1966), Dijkstra & Van Amerom (1985) cite the initial determination *Pterophyllum rigidum* Andrae. The confusion even increased, when Semaka (1965) cited incompletely the name *Ptilophyllum rigidum* (Andrae). Readers might think he has created a combination. That was not new one, and Semaka (1968) decided later to use the corrected spelling *Ptilophyllum rigidum* (Andrae) Krasser. Despite this correction, Macarovici & Turculeț (1972) describe and figure the material under the name *Pterophyllum rigidum* Goeppert. Their work adds nothing to the knowledge on the material and on the species. They base their short description on what Semaka (1962b) wrote, and their plate 14, fig. 2 is just as Semaka’s plate 1, fig. 4. Petrescu & Dragastan (1981) and Czier (1995, 1999, 2000c) cite the material as *Ptilophyllum rigidum*. Alexandru Semaka collected in 1955 the material, and deposited it in the collections of the Geological Committee, Bucharest. In the absence of a microscopical study, the generic attribution cannot be sure.



13, 14. Oarcea & Semaka (1962) recorded from Anina four specimens of *Pterophyllum rigidum* Andrae. They note the presence of the material at the Anina School Group. The specimens are perhaps among the much *Ptilophyllum* foliage seen by Teulea (1996) at the museum from Steierdorf, but these are uncertain data. No exact published data exist regarding the collecting years of the specimens, or the names of the collectors. The authors mention the chiefs of the Geodesic Bureau, who cared of the collection's enrichment since the beginning of the 20<sup>th</sup> Century: Géza v. Bene, Árpád Herman, Virgil Uttzas, Johann Hummel, Virgil Ciobanu, and Cornel Oarcea. However, probably they were not the only collectors.

Givulescu (1966) cites exactly the initial determination *Pterophyllum rigidum* Andrae, but Răileanu *et al.* (1964a), Preda *et al.* (1985) alter it for *Pterophyllum rigidum* Goeppert. Semaka (1965) gave meantime a nomenclatural rectification, attributing the material to *Ptilophyllum*, by using the incomplete name *Ptilophyllum rigidum* (Andrae). Givulescu (1989a) uses the complete denomination *Ptilophyllum rigidum* (Andrae) Krasser. Givulescu & Czier (1990), Czier (1999) cite the material under this name. Only a thorough study could establish what this undescribed material is in fact.

15. Oarcea & Semaka (1962) recorded *Pterophyllum rigidum* Andrae also from Doman. The details concerning the repository and the citations are the same as those noted in the case of the Anina specimens.

16. Semaka (1963) has marked in a table the presence in the 'Lower Liassic at Pleșa' of *Ptilophyllum rigidum* (Andrae) Krasser. According to him, Ion Mateescu was who collected the material in 1952. Mutihac (1964) cites this determination in a very wrong manner, as *Pterophyllum rigidum* (Andrae) Krasser. The initial, correct spelling of Semaka, is cited by Givulescu (1966), and later by Czier (1995, 2000c). Mateescu (1967) cites the wrong spelling *Pterophyllum rigidum* (Andrae) Krasser, but on the next pages of his paper describes and figures the specimen under the name *Pterophyllum rigidum* Andrae. Givulescu (1974), Mutihac (1974, 1990), Preda (1981), cite the material under the name *Pterophyllum rigidum*. The identification of the specimen actually is impossible, because the keeper is unknown. The generic assignment, in the absence of a cuticular study, seems doubtful.

17. Humml (1963) has recorded two specimens of *Ptilophyllum rigidum* (Andrae) Krasser. Czier (1998, 1999, 2001b) cites the determination. The material is under study.

18. Zborea *et al.* (1966) described from the 'Liassic beta - Sinemurian of Crasna' four specimens of *Ptilophyllum rigidum* (Andrae) Krasser. That is a macroscopical, very short, inconclusive description, with no attached figures or



photos. Semaka (1972), Mutihac (1974), Dijkstra & Van Amerom (1985) cite the material under the name *Pterophyllum rigidum* Andrae. Givulescu (1974) and Czier (2000c) cite it with the initial spelling, *Ptilophyllum rigidum* (Andrae) Krasser. Romulus Cioată and Anatol Zberea collected the material in 1960 and 1962, and deposited it at the Geological Committee, Bucharest. A microscopical study could clarify the taxonomy.

19. Semaka *et al.* (1972) note the presence of *Pterophyllum rigidum* Andrae in the 'Rhaetian-Liassic' deposits from Porcului valley. They describe the sampling point, situated about ten meters North from where Manolescu (1932) has mentioned for the first time fossil plants in the Schela Formation. Ilie Huică collected the material between 1963 and 1964, and deposited it in the collections of the Geological Institute, Bucharest. Givulescu (1978), Dijkstra & Van Amerom (1985), cite Semaka's initial determination *Pterophyllum rigidum* Andrae, though the material appears under the nomenclaturally revised name *Ptilophyllum rigidum* (Andrae) Krasser in a table of the same paper of Semaka *et al.* (1972). A new research could confirm the generic attribution.

20. Semaka *et al.* (1972) mentioned the presence in the 'Lower Liassic of Viezuroiu valley' of the species *Ptilophyllum rigidum* (Andrae) Krasser. They give no description, no figuration, and no certain collecting data. A determination given many years ago for an unidentifiable material is rather weak evidence for a sure generic attribution.

21. Semaka *et al.* (1972) mentioned *Ptilophyllum rigidum* (Andrae) Krasser from the 'Sinemurian, perhaps also part of the Hettangian' deposits of the mine Viezuroiu too. According to the authors, Ilie Huică collected the material in 1964, and deposited it in the collections of the Geological Institute, Bucharest. A description and figuration should prove the generic attribution.

22. Semaka *et al.* (1972) recorded specimens of *Ptilophyllum rigidum* (Andrae) Krasser from the 'Liassic of Crasna'. The sampling point is identical with that already Zberea *et al.* (1966) had described. Ilie Huică collected the material in years 1963-1964, and deposited it at the Geological Institute, Bucharest. The identification of the specimens is the first step of a research on the material, necessary for sure taxonomical attribution.

### ***Ptilophyllum* aff. *jurassicum* Kimura & Ohana 1988**

2001a *Ptilophyllum* aff. *jurassicum* Kimura & Ohana. Czier, p. 35

*Locality.* Anina.

*Lithostratigraphic unit.* The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic unit.* The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Age.* Hettangian *pro parte* - Sinemurian.

*Discussion.* Czies (2001a) notes the presence of *Ptilophyllum* aff. *jurassicum* in the 'Lower Liassic layers with *Clathropteris meniscioides*'. The material is under study.

***Ptilophyllum maculatum* Givulescu 1992a**

- 1989 *Ptilophyllum* sp. Givulescu & Farcașiu, p. 139
- 1990 *Ptilophyllum* sp. Givulescu, p. 80
- 1992a *Ptilophyllum maculatum* sp. n. Givulescu, p. 11, plate 1, figs. 1, 2, plate 2, figs. 1, 2, plate 3, figs. 1, 2
- 1992b *Ptilophyllum maculatum* n. sp. Givulescu, p. 241, plate 1, figs. 1 - 3, text-fig. 1
- ? 1996 *Pterophyllum maculatum*. Teulea, p. 2 (possible spelling error for *Ptilophyllum*)
- 1998a *Ptilophyllum maculatum* Givulescu. Givulescu, p. 82, plate 1, fig. 3, plate 2, figs. 1 - 4
- 1998b *Ptilophyllum maculatum* n. sp. Givulescu, p. 14, 37, 76, plate 5, figs. 1 - 4, 9, plate 9, fig. 3, plate 12, fig. 2, plate 21, figs. 1 - 5, plate 22, figs. 1 - 8, text-figs. 6/4-7, 7/3, tab. 1, tab. 6

*Locality.* Anina.

*Lithostratigraphic unit.* The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic unit.* The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Age.* Hettangian *pro parte* - Sinemurian.

*Discussion.* Givulescu & Farcașiu (1989) recorded from the 'Lower Liassic of Anina' specimens of *Ptilophyllum* sp. In other paper published in that year, Givulescu (1989b) writes in a list the name *Ptilophyllum* sp. The listed taxa and the collection indicate that the material is the same in both cases. Next year, Givulescu (1990) presents the material, under the name *Ptilophyllum* sp. He gives a description and figuration, but not figures all the specimens, moreover the figures show only cuticles. The explanations of the figures contain no inventory numbers; therefore, it is uncertain to which hand specimen the cuticular preparation belongs.

Givulescu has frequently changed his mind concerning the age of the material, without explaining why. Givulescu (1990) first accepted „Lower Liassic”, probably because many previous authors had considered this flora Liassic in age, though the Lias coast is far from Anina, and has local meaning. In a next paper, Givulescu (1992a) mentioned „Early Lias - Hettangium”, but nobody has

delimited the Hettangian stage at Anina. Later, Givulescu (1997) considered that the material originates from the interval „Hettangian - lower Sinemurian”. Finally, Givulescu (1998b) denies the presence at Anina of the lower Hettangian plant-bearing deposits, but accepts upper Sinemurian ones, by writing „Upper Hettangian - Sinemurian”.

Givulescu (1992a) published his new species *Ptilophyllum maculatum*, without citing his previous papers dealing with the specimens. He figures only partly the type material. The published inventory numbers, and his figures, show that the material is identical with that he already described and figured under the name *Ptilophyllum* sp. The exact number of the specimens is unknown. Although Givulescu notes that „the author had at his disposal 10 samples, most of them coming from the collection of the Botanical Museum of the University of Cluj-Napoca”, the number of specimens is not necessarily equal with the number of the samples, because the same piece of rock may contain specimens on its both faces. The collectors, and the collecting years also are unknown, moreover the specimens are in four collections, in three cities. Regarding such a type material, the acceptance of a specimen from a collection as holotype, and of other specimens from other collections as paratypes, when the collecting data are unknown, is more than questionable.

In a study simultaneously appeared in other journal, Givulescu (1992b) creates for the second time *Ptilophyllum maculatum* new species. He repeats the diagnosis, description, figuration, and discussion, without citing his other paper (i.e. Givulescu 1992a) in which he has already created this species. Again not referring to his previous publications, Givulescu (1997) publishes a plate that shows the holotype of *Ptilophyllum maculatum*. The figures of the plate are like his already published photos.

Givulescu (1998b) uses the method, of to cite not his own papers, but to present the material repeatedly as being new, also in his booklet. He creates there *Ptilophyllum maculatum* new species for the third time. The description and figuration, in the case of some specimens, however, still is insufficient even for a generic attribution.

According to all the professional and ethical rules, an author should create a species only once. Twice may be an accident of an innocent beginner, but publishing twice a species as new, just in scope to increase the list of the publications, is unacceptable even from the part of beginners. Thrice, however, is a horrible performance. Publishing three times the same species as being „new”, is easy to have more than 300 own publications at the end of a long and productive life. Is the number of the publications more important than their quality? What kind of example is for his fellows an Honorary Academic Professor, who proceeds in this manner?

There are plenty of arguments to carry out a thorough study on all the *Ptilophyllum maculatum* specimens. The diagnosis, description, figuration, should corroborate each other; the hand specimens, cuticular preparations, inventory numbers should concord. Czier (1995, 1999, 2000c) cites the species, and temporarily accepts it. A new research and analysis will decide in a little while if the species is worthy to maintenance or not. Until the results will appear, anybody can believe what will about the generic assignment of the material. Teulea (1996) notes, she saw at the Museum of Steierdorf *Pterophyllum maculatum* specimens. This might be just a spelling error, instead of *Ptilophyllum maculatum*. However, if not written by mistake, Givulescu's *maculatum* species lies in wait for a transfer to the genus *Pterophyllum*.

***Ptilophyllum aninaensis* Czier 1995**

1995 *Ptilophyllum aninaensis* Czier. Czier, p. 748, figs. 3–15

1998a *Ptilophyllum aninaensis* Czier. Givulescu, p. 82, plate 1, figs. 1, 2, 4.

Non plate 1, fig. 3.

*Locality.* Anina.

*Lithostratigraphic unit.* The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic unit.* The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Age.* Hettangian *pro parte* - Sinemurian.

*Discussion.* Czier (1995) has validly created the species *Ptilophyllum aninaensis*. He has compared it with the relevant species of *Ptilophyllum*, then has submitted the manuscript to the peer-reviewed journal „Neues Jahrbuch für Geologie und Paläontologie”, which has accepted it. The species is distinct from *Ptilophyllum maculatum*. Givulescu (1998a), however, has confounded the photos, erroneously supposed that the names of the two species are synonyms, and created a false problem of priority in favour of *P. maculatum*. Czier (1999) does not agree this opinion, and cites the material under the name *Ptilophyllum aninaensis*.

***Ptilophyllum* cf. *aninaensis* Czier 1995**

2001a *Ptilophyllum* cf. *aninaensis* Czier. Czier, p. 35

*Locality.* Doman.

*Lithostratigraphic unit.* The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic unit.* The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Age.* Hettangian *pro parte* - Sinemurian.

*Discussion.* Czier (2001a) mentions the presence of *Ptilophyllum* cf. *aninaensis* in the coal-bearing layers from Doman. The material is under study.

### ***Ptilophyllum acifolium* Givulescu 1998b**

1962a *Stachyotaxus lippoldi* (Stur) Kräusel. Semaka, p. 533 (*partim*), 542 (*partim*), 551 (*partim*), 554 (*partim*), plate 15, fig. a (*pro parte* - top), tab. 1 (*partim*) (spelling error for *lipoldi*)

*Locality.* Anina.

*Lithostratigraphic unit.* The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic unit.* The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Age.* Hettangian *pro parte* - Sinemurian.

*Discussion.* Semaka (1962a) described and figured from the 'Lower Liassic coal complex' opened in the Gustav shaft, a fossil leaf fragment, assigned to *Stachyotaxus lippoldi* (Štúr 1871) Kräusel 1949. Givulescu (1966), Semaka (1970), cite this determination. Based on Semaka's material, Givulescu (1997) creates the new species *Ptilophyllum acifolium*. He provides it with no diagnosis; the denomination thus covers just a new *nomen nudum*. Next year Givulescu (1998b) publishes a description and figuration of the specimen. The descriptions of the two authors differ in some aspects. Unlike Semaka, who gives only macroscopical description, Givulescu describes macro- and microscopically the material, in a more detailed manner. The figuration, however, in both cases is incomplete. Semaka published a plate with a figure showing macroscopically the specimen, whereas Givulescu a drawing, and two photos of the lower cuticle. The not figured upper cuticle is one of the things that cannot fail to be seen. Such a poor presentation scarcely is acceptable as basic documentation for a new species of *Ptilophyllum*. If the figuration of any of the cuticles is absent, there exist no visible proof concerning the hypostomatic character of the lamina, and even the assignment to the order Bennettitales is discussable. For this reason, all authors should describe and figure both cuticles of all the new species of the genus *Ptilophyllum*. The incompletely described or figured species of *Ptilophyllum* are ephemeral. Czier (2000c) cites the species, but possibly will not.

***Ptilophyllum curvatum* Givulescu 1998b**

1997 *Ptilophyllum curvatum* Givulescu. Givulescu, p. 68

*Locality.* Anina.

*Lithostratigraphic unit.* The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic unit.* The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Age.* Hettangian *pro parte* - Sinemurian.

*Discussion.* Based on a leaf fragment from the 'Hettangian - lower Sinemurian deposits of Anina', Givulescu (1997) creates the new species *Ptilophyllum curvatum*, without diagnosis, description, and figuration. Next year, Givulescu (1998b) describes and figures the species, but gives no diagnosis. He does not refer to his own paper from 1997, but comparing the lists of the taxa from the two works, readers may conclude that the material is the same. The description and figuration are incomplete for a new species created in the genus *Ptilophyllum*. The upper cuticle is unknown. Nobody could describe and figure a cuticle that is not preserved. This is exactly such a case, because Givulescu (1998b) himself notes, that no upper cuticle is preserved. An experienced palaeobotanist never should create new species of *Ptilophyllum* on incomplete type material. The cuticles must prove equally the characters of the abaxial and adaxial epidermis, but this is possible only if they exist, in other words if the cuticles are preserved. A single specimen, lack of upper cuticle, is not sufficient to create a useful new species. Czier (2000c) cites in his book the species *Ptilophyllum curvatum*, and still cites it herein, but just because the goal of the present paper is not the revision of the genus. *Ptilophyllum curvatum* is a *nomen nudum* of a not diagnosable species. Such a species is not valid.

***Ptilophyllum grandis* Givulescu 1998b**

1997 *Ptilophyllum grandis* Givulescu. Givulescu, p. 68

*Locality.* Anina.

*Lithostratigraphic unit.* The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic unit.* The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Age.* Hettangian *pro parte* - Sinemurian.



*Discussion.* Based on the study of a fragment from a large leaf, which originates from the „Hettangian - lower Sinemurian” deposits, Givulescu (1997) has created the new species *Ptilophyllum grandis*. As in the cases of other new species, he gave no diagnosis, no description, and no figuration. In a next paper, Givulescu (1998b) gives again no diagnosis, but just a description and figuration. Therefore, the name *Ptilophyllum grandis* Givulescu is other *nomen nudum*. Givulescu (1998b) also in this case uses his favourite method, of not citing his own papers. However, if we compare the lists of the taxa, the material is that from his paper published in 1997. The figuration of the type material is incomplete. The upper cuticle much probably is not preserved. If it would be, a figure could be present. This is unacceptable in the case of a type material. At least a drawing or photo must illustrate the upper cuticle of a new species of *Ptilophyllum*. Czier (2000c) cites *Ptilophyllum grandis*, though this species is unworthy of maintenance.

***Ptilophyllum romanicum* Givulescu 1998b**

1997 *Ptilophyllum romanicum* Givulescu. Givulescu, p. 68

*Locality.* Anina.

*Lithostratigraphic unit.* The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic unit.* The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Age.* Hettangian *pro parte* - Sinemurian.

*Discussion.* *Ptilophyllum romanicum* is a species based on a leaf fossil, of which the collecting data are unknown. Givulescu (1997) has created also this species as *nomen nudum*. He describes and figures *Ptilophyllum romanicum* in a next work (Givulescu 1998b), but even there gives not diagnose. The material supposedly is identical with that from his 1997 paper, but the base of this supposition constitutes only the comparison between the names of the taxa. The figuration of the type material is incomplete. The problem also in this case is with the upper cuticle. Probably it is not preserved, or maybe has been lost in the process of the preparation.

All the palaeobotanists in the world are constrained to work usually on fragmentary material, because completely preserved specimens are extremely rare. If the material is fragmentary, or a cuticle of a specimen is not preserved, this is not a problem when the generic diagnosis does not stipulate entire specimens or cuticular characters. However, in the case of the genus *Ptilophyllum*, some

cuticular characters have diagnostic value. Taxonomists must firmly prove first the generic characters, and then differentiate the specific characters. In the case of a new species, the best possible description and figuration of both cuticles must follow the diagnosis, to prove the specific epidermal characters. A species based on incomplete type material, on which not even the generic characters are present, cannot have valid diagnose, and this is the case of *Ptilophyllum romanicum*. Such species only questionably is attributable to the genus. This is an invalid species, the much so as it has no diagnosis.

For a reason that is not subject of the present paper, Czier (2000c) cites in his book all the *Ptilophyllum* species of Givulescu, and neglects his own species *Ptilophyllum aninaensis*. Since then time has passed, and Czier is not willing to maintain this *status quo*. The *Ptilophyllum romanicum* specimen is under a new research.

### ***Ptilophyllum* sp. B**

2001a *Ptilophyllum* sp. B. Czier, p. 35

*Locality.* Anina.

*Lithostratigraphic unit.* The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic unit.* The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Age.* Hettangian *pro parte* - Sinemurian.

*Discussion.* Czier (2001a) mentions from Banat region four groups of specimens provisorily assigned to *Ptilophyllum* sp. A, B, C, and D. The material from the group „A” is attributed to a species of the genus *Banatozamites* Czier (1996), namely to *B. remotus* Czier (2008). The group „B” is under study.

### ***Ptilophyllum* sp. C**

2001a *Ptilophyllum* sp. C. Czier, p. 35

*Locality.* Doman.

*Lithostratigraphic unit.* The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic unit.* The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Age.* Hettangian *pro parte* - Sinemurian.

*Discussion.* The material, which Czier (2001a) provisorily assigns to the group „C”, is under study.

### ***Ptilophyllum* sp. D**

2001a *Ptilophyllum* sp. D. Czier, p. 35

*Locality.* Doman.

*Lithostratigraphic unit.* The Valea Terezia Sandstone Member of the Steierdorf Formation.

*Biostratigraphic unit.* The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.

*Age.* Hettangian *pro parte* - Sinemurian.

*Discussion.* This material, provisorily assigned by Czier (2001a) to the group „D”, also is under study.

### ***Ptilophyllum* sp.**

1. 1958 *Stachyotaxus lippoldi* (Stur) Kräusel. Semaka, p. 414, tab. 3 (spelling error for *lipoldi*)
2. 1962a *Stachyotaxus lippoldi* (Stur) Kräusel. Semaka, p. 533, 542, 551, 554, plate 4, fig. 3, plate 5, fig. 1, plate 15, fig. a (*pro parte* - right bottom), text-figs. 5, 6, tab. 1 (spelling error for *lipoldi*)
3. 1963 *Cladophlebis* sp. Humml, p. 194
4. 1963 *Zamites* sp. Humml, p. 198 (*pro parte*)
5. 1963 *Pterophyllum* sp. Humml, p. 198
6. 1963 *Ptilophyllum rigidum* (Andrae) Krasser. Humml, p. 199
7. 1966 *Stachyotaxus* sp. Zborea *et al.*, p. 50
8. 1970 *Stachyotaxus lippoldi* (Stur) Kräusel. Semaka, p. 25, 56, tab. 10 (spelling error for *lipoldi*)
9. 1972 *Stachyotaxus lippoldi* (Stur) Kräusel. Semaka *et al.*, p. 439, tab. 1 (*pro parte*) (spelling error for *lipoldi*)
10. 1972 *Stachyotaxus elegans* Nathorst. Semaka *et al.*, p. 439, tab. 1 (*pro parte*)
11. 1989 *Ptilophyllum* sp. (aff. n. sp.). Givulescu & Farcașiu, p. 139
12. 1994 *Ptilophyllum*. Popa, p. 14 (spelling error for *Ptilophyllum*)
13. 2001b *Ptilophyllum* sp. Czier, p. 38, 45, tab. 1

*Localities.* 1, 2, 4, 5, 11, 12, 13. Anina. 3. Doman. 6. Unknown (probably Southern Carpathians). 7, 9, 10. Crasna. 8. Pietrele Albe.

*Lithostratigraphic units.* 1, 2, 11, 12. The Valea Terezia Sandstone Member of the Steierdorf Formation. 3, 4, 5, 13. The Steierdorf Formation – possibly the Dealul

Budinic Conglomerate Member, but most probably the Valea Terezia Sandstone Member. 6. Unknown. 7, 9, 10. The Baia de Aramă Formation. 8. The Ogașul Vodânișchi Sandstone Member of the Svinița Formation.

*Biostratigraphic units.* 1, 2, 11, 12. The *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone. 3, 4, 5, 13. The *Clathropteris meniscioides* Biozone – most probably the *Banatozamites chlamydostomus* Subzone. 6. Unknown. 7, 9, 10. The *Clathropteris meniscioides* Biozone. 8. The *Clathropteris meniscioides* Biozone – probably the *Neocalamites carcinoides* Subzone.

*Ages.* 1, 2, 8, 11, 12. Hettangian *pro parte* - Sinemurian. 3, 4, 5, 6, 13. Hettangian - Sinemurian. 7, 9, 10. Sinemurian *pro parte*.

*Discussion.* 1, 2. Between the years 1951 and 1957, Alexandru Semaka (1958) has collected from several sampling points at Anina nineteen specimens of *Stachyotaxus lipoldi* (Štúr) Kräusel. He deposited them at the Geological Committee, Bucharest. Givulescu (1960, 1966), Semaka (1961, 1964, 1965, 1970), Răileanu *et al.* (1964a), cite his determination. Semaka (1962a) describes macroscopically the material, and figures three of the specimens. Givulescu (1990) gives a new determination. In his opinion, the material is *Ptilophyllum* sp. He publishes photos showing the cuticles, but writes nothing regarding the provenance of the cuticular preparations. The photos possibly represent cuticles of some specimens collected by Semaka, or perhaps cuticles of other specimens. Czier (2000c) cites the material using Givulescu's determination *Ptilophyllum* sp. Owing to the controversial origin of the cuticular preparations, the generic assignment is doubtful.

3. Humml (1963) has recorded from the 'Lower Liassic of Doman' a *Cladophlebis* sp. Czier (1998) initially cites this determination. Czier (2001b) gives later the new determination *Ptilophyllum* sp. The material is subject of a supplementary research.

4, 5. Humml (1963) enclosed in his catalogue some specimens from Anina, thought as belonging to *Pterophyllum* sp. and *Zamites* sp. He notes the transfer of the specimens from the collection of the Anina Coal Mining Exploitation to the Banatului Museum Timișoara. Czier (1998) cites both the determinations. In the following years, Czier (2001b) accomplishes a study on the material. He attributes for the moment the specimens to *Ptilophyllum*.

6. Humml (1963) encloses in his catalogue, among others, a specimen assigned to *Ptilophyllum rigidum* (Andrae) Krasser. He mentions in his acknowledgements the name of Alexandru Semaka, who offered him a precious help in the determination, and in the verification of his determinations. The collecting data are unknown. Humml notes the transfer of the material from the Mining Institute Timișoara to the Banatului Museum. This may be a weakly argument to suppose that the specimen originates from the Banat Region. The rather exactly

known, „Lower Liassic” age of the rock, might be other argument regarding the specimen’s origin area, which probably is somewhere in the Southern Carpathians. Czier (1998) initially cites the initial determination *Ptilophyllum rigidum* (Andrae) Krasser, but later, Czier (2001a) determines the specimen, as *Ptilophyllum* sp. A supplementary study is at this time undergoing.

7. Zborea *et al.* (1966) describe from the ‘Lias beta - Sinemurian of Crasna-Jiu (Crasna-Bach)’ a specimen of *Stachyotaxus* sp. The description is macroscopical, very short, inconclusive, and has no attached figures or photos. Romulus Cioată collected the material in 1960, and deposited it at the Geological Committee, Bucharest. Semaka *et al.* (1972) and Givulescu (1974) cite the determination. Owing to a suggestion received from the part of Prof. Răzvan Givulescu, that all the published *Stachyotaxus* specimens of the Romanian fossil flora in fact are specimens of *Ptilophyllum*, Czier (2000c) provisorily attributes the material to *Ptilophyllum* sp. A long-continued research could only confirm or infirm this statement of Givulescu.

8. Semaka (1970) has collected from the ‘Liassic beta sandstone-series at Pietrele Albe - Stanca’ two specimens of *Stachyotaxus lipoldi* (Štúr) Kräusel. He deposited them in the collection of the Geological Institute, Bucharest. Semaka gives in his paper a very short, macroscopical description of the genus, but not of the specimens. Olaru (1980) cites the determination of Semaka. Czier (2000c) attributes the material to the genus *Ptilophyllum*.

9, 10. Semaka *et al.* (1972) mentioned the presence of *Stachyotaxus lipoldi* (Štúr) Kräusel and *S. elegans* Nathorst, in a ‘Liassic fossiliferous site at Crasna’. The site is identical with that previously described by Zborea *et al.* (1966). Ilie Huică collected the material in the years 1963-1964, and deposited it at the Geological Institute from Bucharest. There are no published inventory numbers, and the number of the specimens is uncertain. Czier (2000c) provisorily assigns the material to the genus *Ptilophyllum*.

11. Among the „fossil plants sampled from the Lower Liassic deposits at Anina, which are preserved in the collection of the Botanical Museum within the University of Cluj-Napoca”, Givulescu & Farcașiu (1989) determined a „*Ptilophyllum* sp. (aff. n. sp.)”. The collecting data are unknown, but in the conception of the authors, these data anyway are less important than the others are. The inventory numbers seem to have no importance, because the authors have not mentioned any. Even the number of the specimens assigned to this strange taxon, is unsure. The number of the hand specimens might be just one, because the authors note, that a cuticular preparation, or epidermal preparation corresponds to each fossil plant specimen, respectively. The existence of those epidermal preparations, however, is dubitable. No one has been published, moreover, the author of the

present study has found in the collection no fossil leaves with preserved epidermal layers of cells, but only leaf impressions and some compressions bearing cuticles. Cuticles do not consist from epidermal cells. They just may preserve the shape of the cells.

In a simultaneously published paper, Givulescu (1989b) presents the lower cuticle of „*Ptilophyllum* sp. (n. sp. ?)”. Taking account of the known collection and comparing the lists of the taxa, the figuration refers much probably to the same material. In a next paper, Givulescu & Czier (1990) revise the determination, as *Ptilophyllum* sp. Czier (2000c) cites this latter in his book. The inventory number, however, even at the present time is unknown.

12. Popa (1994) collected a „*Ptillophyllum*” from Ponor quarry. His paper contains no collecting data, nor a description or figuration of the material. Czier (2000c) cites it as *Ptilophyllum* sp.

13. Czier (2001b) provided some plant fossils kept in the collection of the Banatului Museum, Timișoara, with the label *Ptilophyllum* sp. The material is in undergoing research.

## Conclusions

Rich palaeobotanical literature shows, that the genus *Ptilophyllum* is present in the Lower Jurassic flora of Romania with the species *acutifolium*, *imbricatum*, *rigidum*, *jurassicum*, *maculatum*, *aninaensis*, *acifolium*, *curvatum*, *grandis*, and *romanicum*.

The *Ptilophyllum* material from this study is classifiable in four groups. 1. Specimens of *Ptilophyllum imbricatum*, *P. rigidum*, *P. sp.*, which may be lost or unidentifiable, as well as not described, not figured, or only partly described and figured. 2. Specimens that constitute the type material of the questionable *Ptilophyllum acifolium*, and of the invalid species *P. curvatum*, *P. grandis*, *P. romanicum*. 3. Specimens of *Ptilophyllum aninaensis* and *P. sp.*, attributable to the genus *Ptilophyllum*. 4. Specimens of *Ptilophyllum* cf. *acutifolium*, *P. imbricatum*, *P. aff. jurassicum*, *P. maculatum*, *P. sp.*, which actually are in different phases of the researches.

The so-called „problem of priority” - *P. maculatum* against *P. aninaensis* - is Givulescu’s artificial problem. There is no basis to discuss priority or synonymy in the case of these distinct species. A problem of microscopy might arise instead, because the cuticles of *P. maculatum* Givulescu were studied only in classical light microscopy, whereas the cuticles of *P. aninaensis* Czier also with the SEM. *Ptilophyllum aninaensis* is the best studied and the most relevant species of the genus *Ptilophyllum*, present in the Lower Jurassic flora of Romania.

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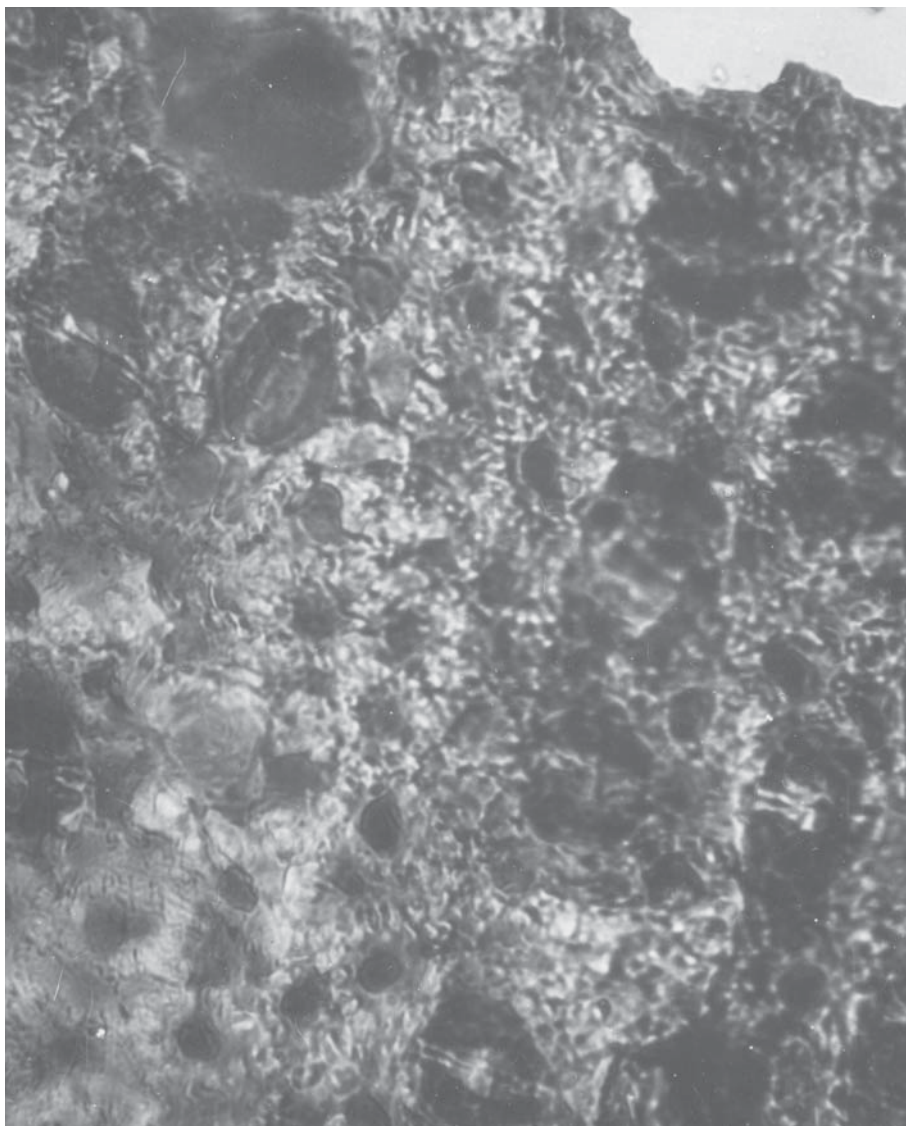
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**Plate I.** *Ptilophyllum maculatum* Givulescu. Lower cuticle preserving impressions of stomata, of papillae, and of epidermal cells disposed in bands. From Anina (Romania, Caraş-Severin County), the Valea Terezia Sandstone Member of the Steierdorf Formation, the *Banatozamites chlamydostomus* Subzone of the *Clathropteris meniscioides* Biozone.