

# PSILOPHYTTITES, A NEW FORM GENUS OF DEVONIAN PLANTS

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## ABSTRACT

The scope of the paper is to institute a new form genus, *Psilophytites*, comprising axes of psilophytes, or plants of strong psilophytalean affinities, with spreading undivided spines.

**M**OST palaeobotanists working with fossil plants from the Lower and Middle Devonian may have met with the difficulty of finding an appropriate name for a certain type of psilophytalean stems, viz. incomplete specimens of axes with spreading spines.

For *spineless* stems we have the designation *Hostimella* Pot. & Bern. As a genus *Hostimella* is certainly not very well defined, but generally it may be said to comprise naked psilophytalean axes, chiefly the ultimate ramifications, at least predominantly bifurcating. If, as the result of overtopping, the ramification has become more or less sympodial, with main axes bearing lateral branches, the name *Aphylopteris* Nath. should be preferred; there are cases of transition between these two genera (but the name *Aphylopteris* may also be used for plants which are not psilophytes). There is no agreement of the palaeobotanists as to the value of another character of *Hostimella*, viz. the 'axial buds', the ovate tubercles often found on the axes at the points of bifurcation or branching. It is scarcely possible to maintain rigidly that such 'buds' must necessarily be present if an axis should be referred to the useful and much used genus *Hostimella*.

In many cases the *Hostimellas* represent the ultimate ramifications of plants which in their lower parts bear spines. But generally it is impossible to say to what natural genus or species a *Hostimella* belongs: The genus, in its modern meaning, is a typical form genus, or at least it ought to be regarded as that.

As regards fragments of *spinous* axes conditions are different. Mostly they have been referred to the genus *Psilophyton* Daws. In many cases this may be correct. But

*Psilophyton* is a natural genus, and the name should not be used indiscriminately for all psilophytalean axes with spines, but only for those about which we know or have reason to believe that they belong to plants possessing in other features, too, the main characters of that genus. Certainly even the type species and the other most important species of the genus, like *P. princeps* Daws. and *P. goldschmidtii* Halle (if specifically different), are not at all so completely known as we should like them to be. But at all events enough is known about them to give a reasonably safe basis for the reconstructions of the whole plants. *Psilophyton* should, therefore, be maintained as a natural genus. At present it is not possible to give it any wholly satisfactory diagnosis, but among the characteristic features may be pointed out the fact that the 'spines' are thin, spreading, not swollen at the bases, never adpressed, nor supplied with leaf-trace bundles (in *P. princeps* they are known to be of a glandular nature); other characters, established with far less degree of certainty, are the protostelic structure of the central strand of the axis and the terminal sporangia on spineless ramifications of the axis. Such species as *P. wyomingense* Dorf and *P. arcticum* Höeg may probably also quite safely be regarded as members of that genus, although they are rather incompletely known.

There are, however, other psilophytes which in some portions of their bodies have axes with spines similar to those of the true *Psilophyton* species, although they belong to other genera.

This is the case with the plants which have been referred to the genus *Asteroxylon* Kidst. & Lang. This is not the place to discuss the taxonomical value of the characters in which *Asteroxylon* differs from *Psilophyton*, nor the right name for some of the species for which the generic name of *Asteroxylon* has been applied. The main point is that while the plants in question in their lower parts have fairly thick stems densely clad with adpressed spines with swollen bases (*Thursophyton* Nath.), and the distal ramifications are

bifurcating and naked, like typical *Hostimellas*, the intervening, and greater, parts have spreading spines; in most cases such parts of '*Asteroxylon*', if found isolated, are indistinguishable from fragments of *Psilophyton*.

Another and more important case to be considered is *Drepanophycus* Goepf. (*Arthrostigma* Daws.). Certainly this genus has a type of fructification entirely different from that of the true psilophytes. In the most typical non-sporangiferous specimens also the thicker parts of the stems are very different in aspect from *Psilophyton*, possessing strong, broad-based, claw-like spines, supplied with leaf-trace bundles. But some of the thinner parts of the axes may have scattered, delicate, straight spines more or less of the same appearance as those of *Psilophyton*, and in some cases it is difficult or impossible to decide to which of these natural genera a fragmentary material belongs.

As a third instance may be mentioned the genus *Psilodendron* Höeg from Spitsbergen. In short, under certain conditions of preservation, fragments of most spinous psilophytes, and some other spinous plants with strong psilophytalean affinities, may have such an appearance that they cannot with certainty be referred to any natural genus, even if the fragments are well preserved.

It may be maintained that if a plant fossil is so incomplete, it does not deserve mention at all. But if that view were correct, artificial genera would never be necessary. For the sake of reference it may frequently be desirable to be able to give even such fragmentary fossils a name, at least a generic one. The frequent use of the name *Hostimella* shows that we need a name for the spineless shoot systems or axes of psilophytes, and it is still more so in the case of spinous axes, which are much more characteristic and important from both botanical and stratigraphical points of view. Much too often they have been referred to *Psilophyton* or *Asteroxylon*, as the following list (without any attempt at completeness) will exemplify:

P. Bertrand, 1913, p. 159, Fig. 1: *Psilophyton princeps*.

A. G. Nathorst, 1915, p. 29, Pl. 8: *Psilophyton* sp.

A. Carpentier, 1927, p. 124, Pl. VI, Figs. 1, 2: *Axes de psilophytale, à comparer à l'Asteroxylon elberfeldense Kr. et Weyl.*

A. Carpentier, 1930, p. 654, Pl. LXIX, Fig. 7: *Axes à comparer à des empreintes attribuées par divers auteurs à des Psilophyton.*

F. Stockmans, 1939, p. 1, Pl. I, Figs. 6, 9, 10: *Psilophyton elberfeldense*.

O. A. Höeg, 1942, p. 59, Pl. XVIII, Figs. 11, 12: *Psilophyton* sp.

O. A. Höeg, 1942, p. 66, Pl. XIX, Figs. 4, 5: *Psilophyton* sp.

O. A. Höeg, 1945, p. 185, Pl. II: *Psilophyton reclissimum* Höeg.

O. A. Höeg, 1945, p. 188, Pls. III, IV, V: *Psilophyton* sp.

J. Hsü, 1947, p. 346 (and 347), Pl. I, Figs. 1b, 6-8 (and 9): cf. *Drepanophycus spiniformis* (and ? a spinous branch).—Rather dubious.

But it is incorrect and unsatisfactory to burden a fairly well-defined, natural genus like *Psilophyton* with 'species' of such uncertain affinities. The only correct way is to institute an artificial genus (a form genus) to which to refer them.

So far no such form genus has been created. Some years ago, in connection with the description of some fossils from the Devonian of western Norway (HÖEG, 1945, p. 189), I pointed out that it would probably be necessary to do so. Later on, in 1948, I had the privilege of discussing the question with Professor Sahni, who agreed as to the necessity of such a generic designation, of which he felt the need when studying his small but interesting collection of Devonian plant-remains from Spiti.

In consequence of the preceding considerations I, therefore, propose a new form genus comprising axes of psilophytes, or plants of strong psilophytalean affinities, with spreading undivided spines. Probably it will be practical to let this genus comprise axes of the said type even if they end in, or bear laterally, branch systems of the *Hostimella* type.

As the name of the new form genus I propose *Psilophytites*.

I should have liked to connect the new genus with the name of our regretted colleague and friend Professor Birbal Sahni, whose recent premature death was a deep-felt loss to the palaeobotanical science and to all palaeobotanists personally. But I have desisted from it. If his name should be commemorated in a fossil plant genus, as it deserves to be, then one certainly ought to choose a better and more important genus than this artificial group of more or less poorly preserved fragments.

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