REWAPHYLLUM SRIVASTAVA, A SUPERFLUOUS NAME FOR *LEPIDOPTERIS* SCHIMPER

Recently a specimen of bipinnate leaf from the Triassic beds of Nidpur, M. P., India, has been described by Srivastava (1984) as *Rewaphyllum nidpurensis* gen. et sp. nov. Srivastava (1984) designates *R. nidpurensis* as the type species of the genus *Rewaphyllum*. In this new genus the material from Argentine Triassic, earlier described by Archangelsky (1968) as *Dicroidium* sp., has also been included by Srivastava (1984) as another new species, *Rewaphyllum argentinicum*.

According to Srivastava (1984) the genus *Lepidopteris* Schimper differs from his genus *Rewaphyllum* in having (i) papillae all over the surfaces of leaf, (ii) blisters or lumps over the rachis, (iii) pinnae being not alike in shape, and (iv) generally radially symmetrical stomata.

In most species of *Lepidopteris* ordinary epidermal cells of lamina bear papillae, but not as a rule. In *L. madagascariensis* Carpentier, according to Townrow (1966, p. 204), "the general cuticle surface is flat or showing low solid papilla". In Townrow's (1966) text-figures 2D, 3A and F ordinary epidermal cells are devoid of papillae. All but one (v/5963) of the several Townrow's (1960) specimens of *L. martinsii* (Kurtze) Townrow had smooth cuticle. In some specimens of *L. ottonis* (Goeppert) Schimper described by Harris (1926) and also in *L. indica* (Bose & Srivastava, 1972; Srivastava, 1974) ordinary epidermal cells of one of the two cuticular surfaces are devoid of papillae.

Presence of blisters or lumps over the rachis is another character of *Lepidopteris*, mentioned by Srivastava (1984), by which it differs from *Rewaphyllum*. However, according to Srivastava (1984, p. 202) in *Rewaphyllum* "rachis marked by irregular minute tubercles". I fail to distinguish the meaning of the two words 'tubercles' and 'blisters', at least when the leaves are preserved in compressed state. Blisters of *Lepidopteris* are believed to be the trichome bases (Townrow, 1960, 1966). *Rewaphyllum nidpurensis* also possesses trichome bases in its rachis cuticle as described by Srivastava (1984). Thus, it becomes evident that the swellings over the rachis of *Rewaphyllum nidpurensis* and those of *Lepidopteris* are essentially the same structures, whether one calls them 'tubercles' or 'blisters' or 'lumps'.

The third criterion by which Srivastava (1984) distinguishes *Lepidopteris* from *Rewaphyllum* is "pinnae being not alike in shape". But there is hardly any difference in shape of pinnae between *Lepidopteris* and *Rewaphyllum*. Both have elongate-lanceolate pinnae with pinnules, towards distal portion lobation gradually becoming shallow (Townrow, 1956; Srivastava, 1984).

The fourth and the last criterion, put forth by Srivastava (1984), by which *Lepidopteris* differs from *Rewaphyllum* is "in general radially symmetrical stomata" of *Lepidopteris*. A stoma, as it is defined (Boke, 1977; Usher, 1966), comprises only the aperture or the aperture and the two guard cells (single guard cell in *Zosterophyllum* and *Azolla*). How this organ of *Lepidopteris* could be radially symmetrical. However, the stomatal pit of *Lepidopteris* is usually radially symmetrical but not always (see Townrow, 1956, figs. 3A, 4D, F, 6B; Townrow, 1960, text. fig. 3J; Townrow, 1966, text-figs. 3B, D, 4D ; Pal, 1984, text-fig. 13F). Moreover, the stoma in Srivastava's (1984) text-figure 2E of *Rewaphyllum nidpurensis* has a radially symmetrical pit.

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Thus, none of the Srivastava's (1984) criterion holds good for distinguishing *Rewaphyllum* from *Lepidopteris*.

Rewaphyllum nidpurensis does possess another important character common with *Lepidopteris*, the zwischerfiedern, that is pinnules set directly on primary rachis. Srivastava (1984, p. 202) states that in a pinna "basalmost pinnule largely borne directly on rachis". Not only that, Srivastava's (1984) text-figure 2A also shows several pinnules between adjacent pinnae borne directly on primary rachis. These 'zwischerfiedern' of *Rewaphyllum nidpurensis*, as appear from Srivastava's (1984) Text-figure 2A, are ovate, orbicular or deltoid in shape, pinnules borne by pinna-rachis are usually longer than broad, some appear to be as long as broad as in case of *Lepidopteris martinsii* (Townrow, 1960, text-fig. 6D).

Venation in pinnules of *Rewaphyllum nidpurensis* is obscure. However, there is suggestive evidence of a midvein in the cuticle (Srivastava, 1984, p. 202). Also in species of *Lepidopteris* the pinnules are characterized by a midvein, often marked in the cuticle.

In *Rewaphyllum nidpurensis*, Srivastava (1984) states that "inner wall of subsidiary cells cutinized, papillae overhanging or projecting over pit, sometimes papillae feebly developed or only bulging towards pit, at times giving a thickened rim around pit" (Srivastava, 1984, p. 202). Species of *Lepidopteris* also possess cutinized papillae or lappetts overhanging the stomatal pit. But stomata without overhanging papillae or lappetts also occur in all known species of *Lepidopteris* (Harris, 1932; Townrow, 1960, 1966; Pal 1984). In *L. martinsii*, about 25% of stomata are without cutin lappetts and the pits showing a cutin rim (Townrow, 1960, p. 346).

Trichome bases have been said to occur over the surfaces of lamina of *Rewaphyllum nidpurensis* (Srivastava, 1984) as also in case of *Lepidopteris stormbergensis* (Townrow, 1956). However, in *Rewaphyllum nidpurensis* trichomes, as stated by Srivastava (1984, p. 202), "commonly emerging from the side-walls" is amazing. I fail to recognize the trichome in his text-figure 2H.

Thus in all its available features the specimen of *Rewaphyllum nidpurensis* agrees with the genus *Lepidopteris*. However, the only specimen has too ill preserved cuticle (evident from Srivastava's, 1984, pl. 2, figs. 2-6, text-fig. 2C, G, F) to deserve a distinct specific name. But, if one likes to give this specimen a distinct specific status, then according to Art. 55. 1 of I.C.B.N. (Voss *et al*, .1983), it should be called as *Lepidopteris nidpurensis* (Srivastava) comb. nov. (basionym : *Rewaphyllum nidpurensis* Srivastava, 1984).

As *Rewaphyllum nidpurensis* Srivastava, the type species of the genus *Rewaphyllum* Srivastava, has been proved to belong to the genus *Lepidopteris* Schimper, the name *Rewaphyllum* becomes a superfluous name for *Lepidopteris* and therefore illegitimate and should be rejected (I.C.B.N. Art. 63, Voss *et al.*, 1983).

As the generic name *Rewaphyllum* is illegitimate, its another species *R. argentinicum* Srivastava (1984) needs reconsideration. As already mentioned, *R. argentinicum* is based on Argentine Triassic specimens and being well aware of the scanty nature of the material Archangelsky (1968) originally described it as *Dicroidium* sp. As the material is highly fragmentary, moreover, without examining the original specimens, dealing with its morphotaxonomy does not appear a proper justice to this material. In my opinion it should be regarded as *Dicroidium* sp. as done by its original author (Archangelsky, 1968) until more better specimens are recovered.

Srivastava (1984) opined that *Dicroidium giarensis* Pal (1984) should be placed in *Rewaphyllum*. However, he has not given any reason for this. While dealing with *Dicroidium* sp. (Archangelsky, 1968) and *D. giarensis* (Pal, 1984) under the genus

Rewaphyllum, nowhere in this paper Srivastava (1984) compares *Rewaphyllum* with the genus *Dicroidium* as a whole. In all its available features *Dicroidium giarensis* agrees with the generic circumscription of *Dicroidium*, it possess odontopteroid veins in pinnules, amphistomatic cuticle, transversely orientated stomata in rachis, rectangular or broadly oval stomatal pit and subsidiary cells often differentiated into polar and lateral ones. Subsidiary cells in *Dicroidium giarensis* are often papillate and sometimes the papillae are overhanging the stomatal pit as has been met with in same specimens of *Dicroidium odontopteroides* (Anderson & Anderson, 1983, pl. 95, figs. 7, 8) and *D. crassinervis* (Anderson & Anderson, 1983, pl. 89, figs. 2, 6-8; pl. 91, figs. 2, 3, 6-8; pl. 94, fig. 8; text-fig. 6.1) from the Molteno Formation of South Africa.

References

ANDERSON, J. M. & ANDERSON, H. M. (1983). *Palaeoflora of Southern Africa, Molteno Formation (Triassic), Volume* 1. Rotterdam.

ARCHANGELSKY, S. (1968). Studies on Triassic fossil plants from Argentina. IV, the leaf genus *Dicroidium* and its possible relation to *Rhexoxylon* stems. *Palaeontology*, **11** : 500-512.

BORKE, H. N. (1977). Epidermis (plants), pp. 39-40 in Lapedes, D. N. *et al.* (Eds.)- *McGraw Hill Encyclopedia of Science and Technology, Vol.* 5.

BOSE, M. N. & SRIVASTAVA, S. C. (1972). *Lepidopteris indica* sp. nov. from the Lower Triassic of Nidpur, Madhya Pradesh. *J. Palaeont. Soc. India*, **15** : 64-68.

HARRIS, T. M. (1926). The Rhaetic Flora of Scoresby Sound, East Greenland. *Medd. om Greenland*, **68** : 45-148.

HARRIS, T. M. (1932). The fossil flora of Scoresby Sound, East Greenland. Part-2 : Description of seed plants incertae sedis together with a discussion of certain cycadophyte cuticles. *Medd. om Greenland*, **85** (3) : 1-112.

PAL, P. K. (1984). Triassic plant megafossils from the Tiki Formation, South Rewa Gondwana Basin, India. *Palaeobotanist*, **32**(3) :

SRIVASTAVA, S. C. (1974). Pteridospermic remains from the Triassic of Nidpur, Madhya Pradesh, India. *Geophytology*, **4**(1) : 54-59.

SRIVASTAVA, S. C. (1984). New leaf compressions from the Triassic of Nidpur, India. *Geophytology*, **14** (2) : 199-207.

TOWNROW, J. A. (1956). The genus *Lepidopteris* and its southern hemisphere species. *Novsk. Vid.-Akad. Oslo. Mat. nature, Kl.*, **2** : 1-28.

TOWNROW, J. A. (1960). The Peltaspermaceae, a pteridosperm family of Permian and Triassic age. *Palaeontology*, **3** : 333-361.

TOWNROW, J. A. (1966). On *Lepidopteris madagascariensis* Carpentier (Peltaspermaceae). *J. Proc. R. Soc. N. S. W.*, **98** : 203-214.

USHER, G. (1966). *A Dictionary of Botany*. Constable, London, 404 pages.

VOSS, E. G. *et al.* (Eds.) (1983). *International Code of Botanical Nomenclature*. Bohn, Scheltema & Holkema, Utrecht.

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