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ON IDIOBLASTS IN *GASTROCHILUS* D.DON AND *RHYNCOSTYLIS* BLUME (ORCHIDACEAE)

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The occurrence of idioblasts in the form of tracheoids, sclereids, hyaline cells, raphides and their co-occurrence in the mesophyll at the vein endings have opened a new taxonomic interest in seed plants. The occurrence of tracheoids has already been reported by T.A. Rao (1992) but the above genera required special attention because of their diverse size, shape and positional relationship to the vein endings. This aspect, has been studied in details for a few species of *Rhyncostylis* Blume and *Gastrochilus* D.Don.

METHODOLOGY

The leaf segments of herbarium specimens were initially partially cleared by soaking them in 5% Sodium Hydroxide for seven days at 40° C, subsequently they were thoroughly washed in distilled water and flooded with a mixture of super saturated Chloralhydrate solution for seven days. (Foster, 1955; Rao, 2007). At room temperature until they become perfectly transparent. The leaf sector were dehydrated in an alcohol series and mounted in Canada Balsam without staining. A few cleared leaf sectors were macerated and mounted in Lactophenol for preparing camera lucida drawings.

OBSERVATIONS

Gastrochilus acualis (Lindl.) Kuntze

Uniseriate epidermis with thick cuticle is observed. Sub epidermal sclerenchymatous layer is also prominent. The mesophyll in characterized by scattered club shaped idioblastic tracheoids with cellular thickenings, Raphides are distributed through out the mesophyll.

Voucher specimen: Fresh material from Cauvery Nisargadhama Orchidarium at Kushalnagar, Kodagu dist. Karnataka, Feb. 2001.

Gastrochilus flabelliformis (Blatt & McCann) C.J. Saldhana & D.H. Nicolson

Uniseriate epidermis with thick cuticle is observed. Sub epidermal sclerenchymatous layer is not so much prominent. Mesophyll is characterized by macrotracheoids.

Voucher specimen: Nilgiri, Oct. 1988, *T.A. Rao* s.n. (CAL).

Gastrochilus inconspicuous Kuntze

Uniseriate epidermis with thick cuticle is observed. Sub epidermal sclerenchymatous layer is prominent. The mesophyll is characterized by macrotracheoids with celluosic thread like structure joined at both the ends.

Voucher specimen: Bihar, Feb. 1896, *D. Prain* s.n. (CAL).

Gastrochilus pulchellus (Wight) Schlter

Uniseriate epidermis with thick cuticle is observed. Sub epidermal sclerenchymatous layer is prominent. Mesophyll is characterized with lignified hexagonal cells and numerous raphides.

Voucher specimen: Karnataka, Nov. 1997. *B. Ghosh*, s.n. (CAL).

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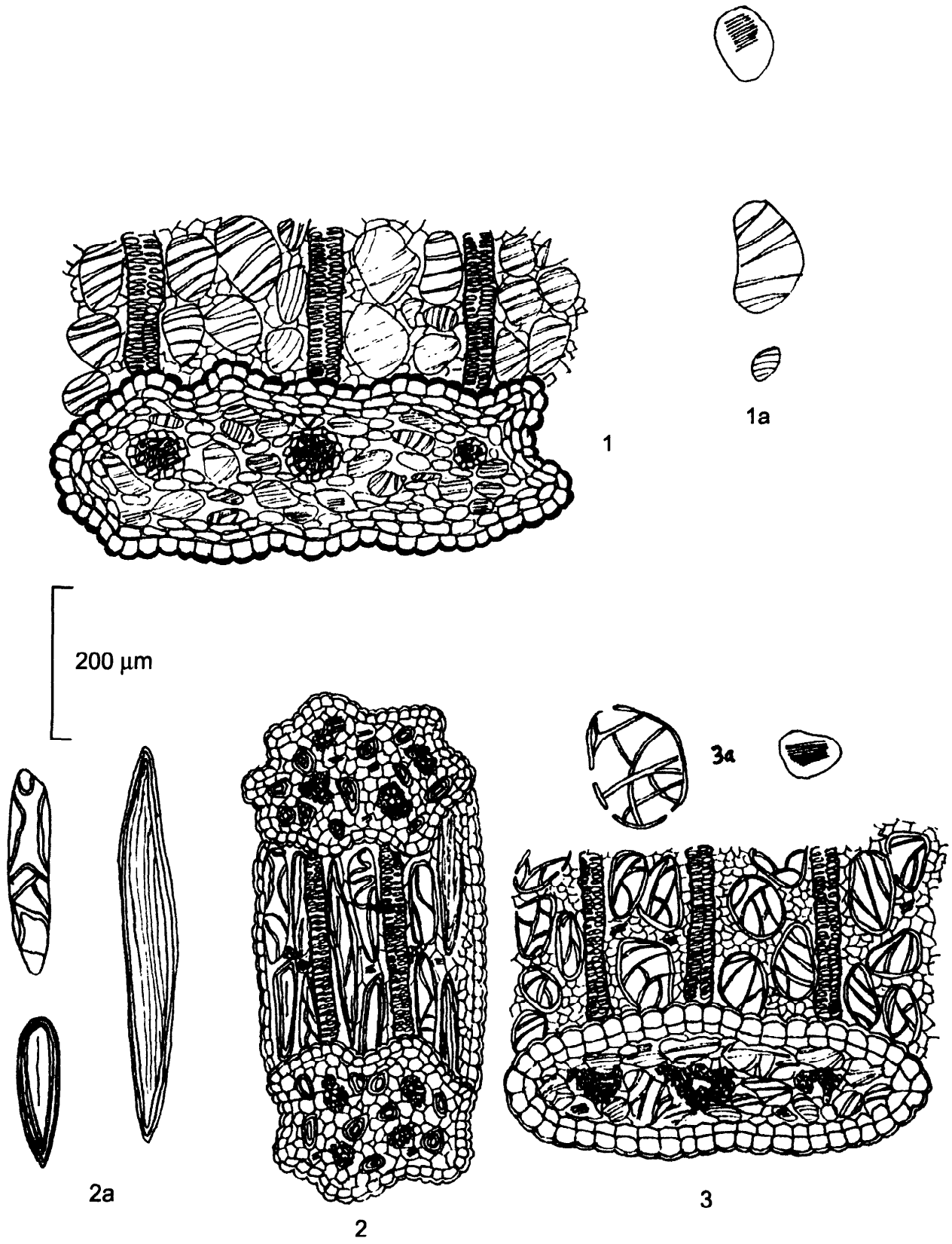

Figs. 1–3 : Semidiagrametic sketches of transverse combined with paradermal sections :
1 & 1a. *Gastrochilus acualis* (Lindl.) Kuntze Scattered club shaped tracheoids with cellular thickenings and Raphides are distributed in mesophyll; **2 & 2a.** *Gastrochilus inconspicuous* Kuntze - Macrotracheoides with cellulosic thread like structure joined at both ends;
3 & 3a. *Rhyncostylis densiflora* (Lindl). L.O Williams – Macrotracheoides and raphides in mesophyll.

Rhyncostlylis densiflora (Lindl.) L.O. William

Multilayered epidermis with thick cuticle is observed. Sub epidermal sclerenchymatous layer is prominent. Mesophyll is characterized with macrotracheoids and raphides.

Voucher specimen: China Canton, *F.A. Meclure* 8130(CAL).

Rhyncostylis retusa (L.) Blume

Multilayered epidermis with cuticle is observed. Subepidermal sclerenchymatous layer is prominent. Mesophyll is characterized with lignified hexagonal cells and numerous raphides.

Voucher specimen: Madhya Pradesh, 21.4.1965, *Panigrahi* 8811 (CAL).

FUNCTIONAL RELATION TO IDIOBLAST TYPOLOGY

Regarding the function of tracheoides, van Tieghem considered them as an irrigation tissue comparable to those of *Podocarpus* and *Cycas*. Rao (1992) considered them to be parts of the tracheidal veins and Dahlgren (1971) has confirmed their connection with veins, club shaped macro tracheoids with the cellolosic thickenings are joined end to end. It is obvious that all these examined species not only give mechanical support to the plant as well as help in conduction and storage of water for metabolic activity (Kaushik 1982; Rao, 1998).

DISCUSSION

A topographical survey of the cleared lamina of all species has revealed that tracheoids are present almost in all the investigated taxa. In *Gastrochilus* the presence of scattered club shaped idioblastic cell with very large sized tracheoids having cellular thickening are representing diagnostic character. In *Rhyncostylis* the presence of lignified hexagonal macrotracheoids and numerous raphides are representing diagnostic character. Their structural features and locations in the mesophyll tissue which distinguishes them to segregate into distinct types of idioblasts. This feature can be utilized as a diagnostic endomorphic feature to identify a few species of the genus not in flowers and also help in solving the taxonomic problems during the revisionary studies. This idioblastic characters are additional tool for identification with vegetative parts collected and stored in several herbaria. Efforts are being made to collect and study all the species of the same genus to build a key of taxonomical implications.

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