

R. Brown, *A. nilotica* DeCaisne, *A. filiculoides* Lamarck, *A. microphylla* Kaulfuss, *A. caroliniana* Willdenow, and *A. mexicana* Presl has a distinctive perine structure suitable for species recognition. One California population examined, thought to be *A. filiculoides*, had a perine structure unlike any of the 6 recognised species. Its perine partially resembled that of *A. filiculoides* var. *rubra* (R. Br.) Strasburger distally and that of *A. microphylla* laterally, as well as having some unique structural features. *A. mexicana* and *A. caroliniana*, recently considered by some as the same species, have distinctly different perine structures, and on this basis, both taxa seem as deserving of species status as do *A. filiculoides* and *A. microphylla*. The authors are grateful to Drs Diara, Kaplan, Kulasooriya, Rains, Talley, Warne and Watanabe for providing collections of sporulating *Azolla*.

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### Perispore morphology in the Aspleniaceae

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Perispore morphology in the Aspleniaceae is reviewed, and the following conclusions derived.

1. Similar perispore patterns have evolved independently in several groups within the family.
2. Perispore patterns change gradually by minor modifications of the perispore layers.
3. There are no sharp boundaries between perispore 'types'.
4. Perispore patterns in the 'satellite' genera are not different from patterns within *Asplenium sensu stricto*.
5. Perispore characters used with care and together with other characters may prove to be important in tracing phylogenetic relationships within this family.

### Perispore morphology in New Guinea Aspleniaceae

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An investigation was conducted using the SEM into the perispore morphology of 60 species of *Asplenium* and 5 species of *Diplora*, to assess its value in constructing

groups within the Aspleniaceae. Puttock and Quinn (1980) had previously described 9 groups within *Asplenium* in Australia, considerably modifying the groups proposed by Holttum (1954). Four additional groups have been described from the present studies. It would appear that group 4, as defined by Puttock and Quinn, requires closer examination.

Both *Diplora* and *Asplenium* sect. *Thamnopteris* (Holttum 1974) show considerable variation in perispore morphology, each including representatives from at least three groups. Studies of the morphology and anatomy of *Diplora* indicate that it is polyphyletic in origin and consequently it should not be treated as a separate genus but as part of *Asplenium*. The New Guinea species of sect. *Thamnopteris* have a dense pattern of fimbria in the areolae but considerable variation occurs in the patterns of ridge development. Other species, not in sect. *Thamnopteris*, show similar perispore morphology.

Perispore morphology alone, like other morphological characters, will not provide a basis for erecting clearly defined groups. A wide variety of morphological, anatomical and cytological data will be necessary for understanding the relationships within the Aspleniaceae in Malasia.

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Puttock, C. F. and Quinn, C. J. 1980. Perispore morphology and taxonomy of the Australian Aspleniaceae. *Aust. J. Bot.* 2, 305–322.

### Light and scanning electron microscope studies on the perispore in the genus *Pyrrosia*

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Light and scanning electron microscope studies have been made on the spores of 17 species belonging to the genus *Pyrrosia* (including *Drymoglossum* and *Saxiglossum*). All of the species investigated have a perispore around the exospore, and the structures of perispores are diverse within the genus. As far as the present study is concerned, the perispores of this genus can be classified into the following three groups:

(1) A perispore of many verrucae, which are 6–10  $\mu\text{m}$  high and 2–5  $\mu\text{m}$  wide, and a very thin membrane surrounding these verrucae. The perispore stains red with PAS reaction and appears dark blue in Giemsa staining. The following species belong to this group: *P. rupestris*, *P. lanceolata*, *P. varia*, *P. longifolia*, *P. confluense*, *P. nummularifolia*, *Drymoglossum piloselloides* and *D. fallax*.

(2) A perispore which is membraneous and stains red with PAS reaction, and makes a few folds. The following species are included in this group: *P. winkeri* and *P. angustata*.