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THE MYRISTICACEOUS SEED

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SUMMARY

The tegmic pachychalaza is considered along with the problem of abortive seeds.

The recent note by Van Heel (1982), who kindly sent me a copy, shows that there is still uncertainty about the construction of the tegmen. I have re-examined some rather poor slides that I have and it seems that he may be right. He finds the construction to be that as originally described in 1885; the free part of the tegmen forms merely a microscopic cone round the micropyle while the rest of the tegmen is an ellipsoidal jacket, developed by intercalary growth, round the endosperm. Thus the tegmen is a tegmic pachychalaza (Corner, 1976), as occurs in some Euphorbiaceous seeds, and it is from this structure that the ruminations develop. When studying these seeds, I was more intent on deciding whether they were pachychalazal or not; in tracing the tegmen to the chalazal base, I may have overlooked the vestigial free part. Yet, I have some doubt.

The illustrations on which Van Heel relies (his figures 7 and 12) show abortive seeds of squat form, evidently unfertilised, with compressed embryo-sac and dilated chalaza. Such parthenocarpic fruits with abortive seeds occur frequently in the family, as I noted for *Horsfieldia sylvestris*. There was a female tree of this introduced species in the Singapore Botanical Garden and no male was known to exist in the Malay Peninsula; its seeds, of course, never germinated. In other families I had found that such seeds failed variously to develop a typical structure and that the chalaza often dilated abnormally. Hence I used to discard such seeds though they certainly have great interest in showing the number and complexity of the factors which have had to be arrested in the perfection of the flower as a separate entity from the fruit. In this way Myristicaceae appear, perhaps, as the most primitively imperfect of angiosperms; pericarp, aril, and testa may develop fully and continuously from their unpollinated flowers, e.g. *Virola sebifera* with even tegmic details (Corner, 1976). I think that it still needs to be shown that the fertilised Myristicaceous seed has, in all genera, a tegmic pachychalaza.

Then, I refer to the two species of *Knema* which I figured as *K. laurina* and *Knema sp.* In these the ruminations developed from the chalaza, though in *Knema sp.* there were also slight longitudinal ridges from what I took to be the tegmen. Possibly these species have only a basal tegmic pachychalaza, such as I figured for *Dipterocarpus zeylanicus* (Corner, 1976). Comparison with Euphorbiaceae suggests that some Myristicaceae may have a vascular tegmen, as well as the vascular tegmic pachychalaza of others.

From what little is known about it, the tegmic pachychalaza of Euphorbiaceae is initiated in the ovule. In Myristicaceae it does not appear until the seed begins to form. In both it finally develops the typical structure with exotegmen. Thus it is tegmic, not chalazal. In the pachychalazal seed the intercalary jacket is formed from the junction of both integuments at the chalaza. Thus the seed-coat in these cases may have a firm exotesta (if it is not sarcotestal) but no endotesta and no exotegmen. The seeds with tegmic pachychalaza have a normal and discrete testa. I have always considered the term pachychalaza as rather inappropriate because the chalaza is the internal region of the seed (or ovule) which unites the integuments and nucellus; it has no outside. I used the term because it had become established. There is an analogy with the ovary. The superior syncarpous ovary with the free parts of the carpels reduced to styles or stigmatic lobes is comparable with the tegmic pachychalaza. The inferior syncarpous ovary with receptacular wall is comparable with the pachychalaza.

REFERENCES

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HEEL, W.A. VAN. 1982. Note on the structure of developing seeds of Knema and Horsfieldia (Myristicaceae). Blumea 28: 53–60.