

POLLEN DIMORPHISM IN *ROUREA SANTALOIDES* W. & A.

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ABSTRACT

In some specimens of *Rourea santaloides* W. & A. biaperturate pollen occur along with the normal triaperturate ones. Occurrence of biaperturate pollen grains varies in percentage frequency in plants collected from different localities.

INTRODUCTION

Dimorphic and polymorphic pollen grains have been reported in different plants from time to time by different workers like CLAUSEN (1960), FAEGRI AND DEUSE (1960), NAIR (1961), LABOURIAU *et al.* (1965), MEHRA AND DOGRA (1965), SPIRLET (1965), SHARMA (1968), MANDAL *et al.* (1974), HANSEN (1980), ROGERS (1980) and others. Deviation from normal pollen type may range in different characters of the palynomorph for different plants.

Rourea santaloides W. & A. is a member of the tropical family Connaraceae. Pollen grains of the family are prolate-spheroidal to spheroidal in shape, small to medium-sized, exine 1.5-2.5 μm thick with rugulo-reticulate to reticulate ornamentation, tricolporate. Ectoaperture distinct, colpus tapering or slit like; endoaperture distinct or indistinct with characteristic granules (operculum). Pollen morphological studies in the family Connaraceae [181 materials from 59 species (s. l.) from 7 genera] revealed the occurrence of dimorphic palynomorph in *Rourea santaloides* W. & A.

MATERIAL AND METHODS

Polliniferous materials were collected from the authentic herbarium sheets of the Central National Herbarium (CAL) and were acetolysed (ERDTMAN, 1952). Seven collections from five different localities were examined. Percentage frequency have been calculated from the total counts and photomicrographs were enlarged $\times 1500$. ERDTMAN (1952) and FAEGRI AND IVERSEN (196A) were followed for pollen morphological terminology. NPC system of aperture characterisation is used as per schedule of ERDTMAN (1963). Nomenclature followed after LEENHOUTS (1958) on the revision of Connaraceae for 'Flora Malesiana'. Pollen slides were deposited in the sporotheca, Palynology Laboratory, Central National Herbarium, B.S.I., Howrah.

Material studied—Locality—Maharashtra : Collection—Talbot, W. A. s.n. CAL—100443, Janardhanan, K. P.—81759; Loc. Sri Lanka : Col. NIL, CAL—100451, Col. NIL., No. 749; Loc. Karnataka : Col. Talbot, W. A. s.n. CAL—100444; Loc. Kerala : Col. Calder, G. C. 1544; Malay peninsula : Col. Hanif *et al.*—2465.

OBSERVATION AND DISCUSSION

In *Rourea santaloides* W. & A., the normal pollen grain is found to be tricolporate, spheroidal, with reticulate exine ornamentation; endoaperture is covered with charac-

teristic fine granules. This observation is based on seven collection as mentioned earlier. In addition to the normal pollen type, some 2-colporate pollen are found in various proportions. Materials from Maharashtra has 5.5 per cent of bicolporate grains based on a total of 455 counts, while that of Karnataka has 11 per cent of total 430 counts, materials from Kerala has 10.5 per cent of total 380 counts, materials from Sri Lanka has 9.5 per cent of total 465 counts. Sample from Malay peninsula lacks such dimorphic pollen grains. Other palynological characters are similar in normal and dimorphic palynomorph.

Detailed description of two kinds of pollen grains found in *Rourea santaloides* W. & A. is given below. *Normal type* : Pollen isopolar, 3-colporate, NPC—345, spheroidal, $P \times E = 19 - (19.8) - 20.5 \mu\text{m} \times 19 - (19.9) - 20.5 \mu\text{m}$; P/E ratio = 0.92—1.05 ; colpus tapering extending up to poles ; endoaperture—circular, margin indistinct, endoaperture area covered with fine granules. Exine $1.5 \mu\text{m}$ thick, reticulate, lumina $0.5-2 \mu\text{m}$, reticulation finer with decreased lumina size towards aperture (Pl. 1, Figs. 1-4).

Dimorphic type : Pollen 2-colporate, NPC—245, decrease in lumina size towards aperture is not so prominent. All other characters are similar with the normal pollen type (Pl. 1, Figs. 5 & 6).

Sample from Malaya peninsula represents no such abnormal pollen grains interestingly. This fact reminds the observation of HANSEN (l.c.). SPIRLET (l.c.) also observed variation in pollen grain size and exine ornamentation in the pollen grains of same species from different localities in Passifloraceae.

CONCLUSION

Occurrence of dimorphic pollen grains in a plant are not common phenomena as the morphology of pollen grain is supposed to be constant in a given species. Such variations may be of natural occurrence or because of various factors such as ecological conditions, geographical distribution, etc. Whatever may be the case, it is related to the genetic mechanism interfering with meiosis.

An investigation of well-fixed materials of young anthers is highly desirable and cytologists are strongly urged to pay attention to this problem. Why the nuclei in a certain proportion of tetrads within one anther fail to obey the rule is not quite clear. However, these variations are important in the interpretation of the genetic state of the species.

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EXPLANATION OF PLATE

Pollen dimorphism in *Rourea santaloides* Wight & Arnott (Connaraceae).

PLATE I

Rourea santaloides W. & A. Figs. 1-6 × 1500.

Normal pollen type: Figs. 1-2. Details of exine. Fig. 3. Optical section meridional and aperture in profile. Fig. 4. Optical section equatorial showing columellae, tectum and operculum in apertural area.

Dimorphic pollen type: Fig. 5. Aperture and details of exine. Fig. 6. Optical section equatorial showing columellae, tectum and operculum in apertural area.

