

reported herein are collected from the top layers of these shales.

The Trionychids or soft shelled turtles are cyptodires that occur today in Asia, Africa and North America. Earlier existence of such vertebrate animals is reported from the Miocene rocks of South America⁴, and the Palaeocene rocks of Australia⁵. The present study may be the first to report the possibility of such an organism living in the parts of Saurashtra during the time the inter-trappean beds were being deposited.

The objective identification of our fossil form as Trionychide may appear to be some-what dubious on account of non availability of a complete specimen. However, the material although fragmentary and badly preserved appears to bear close resemblance to the above group of turtles on the following points:

1. Our material in the form of external cast resembles the cast of the turtle carpace and its plastron (figure 2a, b).
2. The surface textural pattern of this fossil form agrees well, and is restricted to Trionychids, viz the development and presence of parasagittal ridges on the dorsal surface are very conspicuous.

Further identification of the specimen beyond Trionychide to its generic or specific level is not possible because of the fragmentary nature of our specimen and non-preservation of its coastal plates. Furthermore, in the absence of stratigraphically useful

fossils the exact age of this specimen is also very uncertain.

It may, however be concluded that the above mentioned record, although very scanty, is rather suggestive to infer the presence of turtles in the inter-trappean beds of Saurashtra. It is expected that future collection of such fossils from this area may reveal better specimens to allow resurrection of the fossil form reported here.

The occurrence of the turtle fossils along with the fish indicate warm, temperate and tropical conditions with fluviatile and lacustrine environments that prevailed between the successive outbursts of lava flows. It was perhaps a long non-eruption phase during which the inter-trappean beds were deposited and their fluviatile, lacustrine environments allowed the turtles to flourish.

Thanks are due to Dr G. L. Badam of the Deccan College, Pune, for confirming the identification of the fossil turtle and for his useful suggestions in improving the manuscript.

1 April 1985; Revised 30 July 1985

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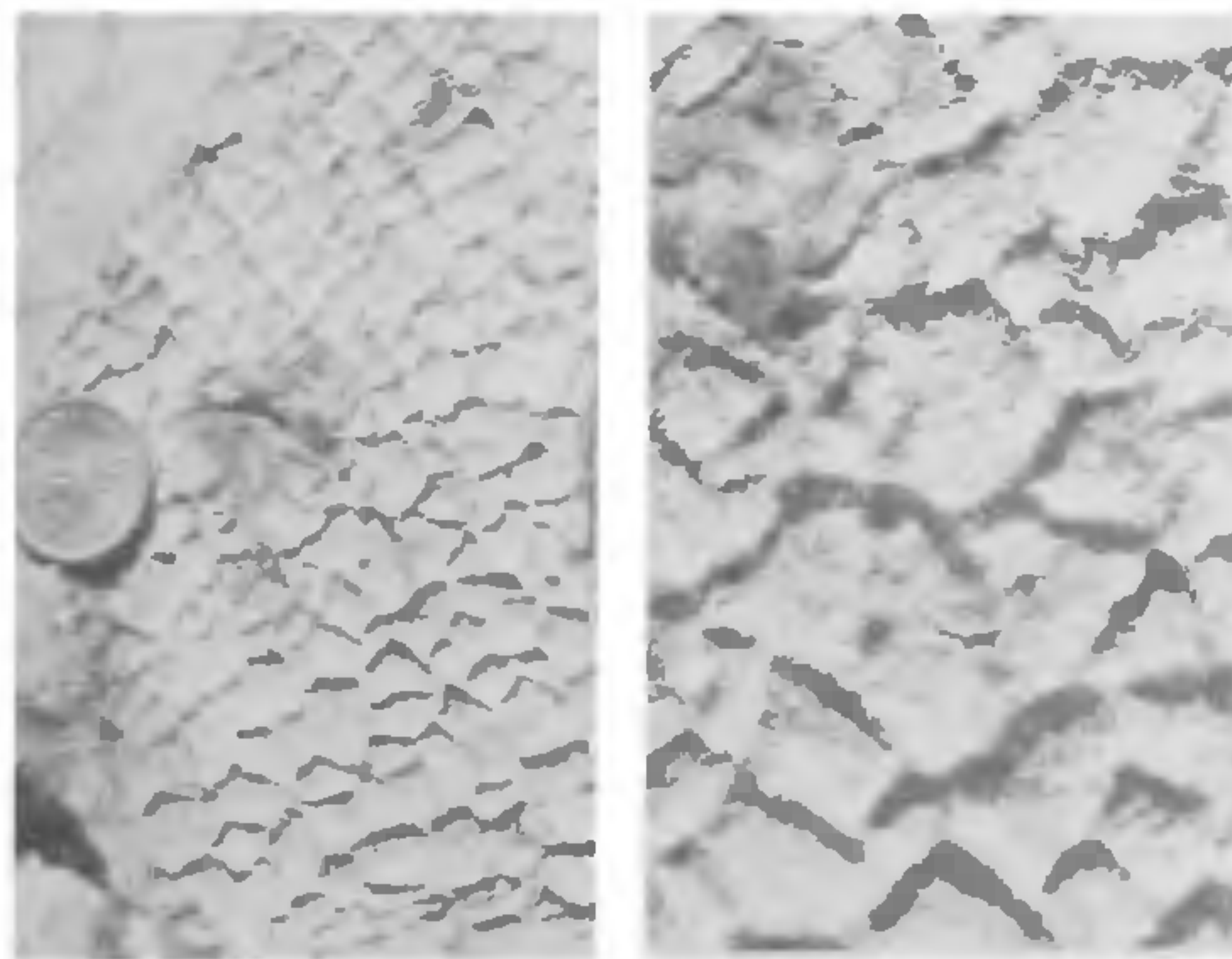
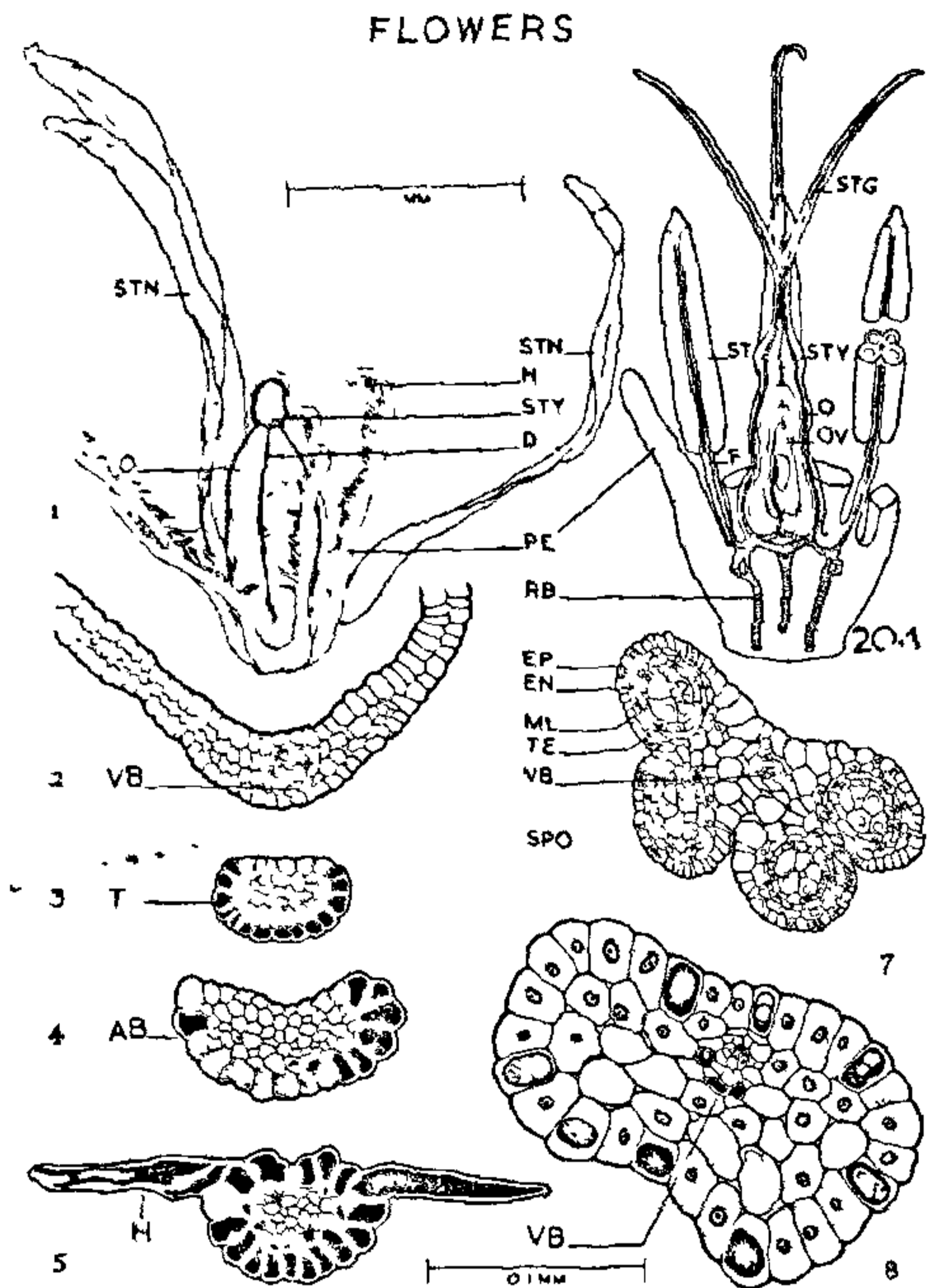


Figure 2. (a) Photograph of external cast that resembles parasagittal ridges in Trionychid turtles. (b) Enlargement of its part.

POLYMORPHIC FLOWERS IN CYPERACEAE—A NEW REPORT

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WHILE investigating a large number of spikelets of *Scirpus grossus* L., it was observed that glumes,



Figures 1-8. 1. A cleared preparation of a pistillate flower showing five perianth lobes, three staminodes and the carpel with broken stigmatic lobes 2. T.S. of a young glume. 3-5. T.S. of perianth members in different stages of development. 6. A diagrammatic L.S. of a normal hermaphrodite flower. 7. T.S. passing through the anther. 8. T.S. passing through the filament. (AB = Abaxial side; D = Dorsal bundle; EN = Endothecium; EP = Epidermis; F = Filament; H = Hair; ML = Middle layer; O = Ovary; OV = Ovule; PE = Perianth lobe; RB = Receptacular bundle; SPO = Sporogenous tissue; ST = Stamen; STG = Stigma; STN = Staminode; STY = Style; T = Tannin; TE = Tapetum; VB = Vascular bundle.)

bearing a single flower each in their axil, were arranged spirally along the axis of spikelet. So far only one type of flowers has been reported in *S. grossus* L.¹⁻³, but in the present investigation, two types of flowers viz unisexual-pistillate and bisexual flowers were observed, the presence of unisexual-pistillate flowers in this plant is a new record. The flowers were generally bisexual (figure 6), but in a few cases, unisexual-

pistillate flowers were found at the base and bisexual ones near the apex of the spikelet.

The sessile, bright yellowish brown, trimerous, zygomorphic and hypogynous flowers were spirally arranged in a spikelet and subtended by glumes. Each glume is boat shaped and has a single vascular strand (figure 2).

The sessile, bisexual flowers bear five bristle-like perianth lobes. Each perianth lobe is an oval structure in transverse section (figure 3). The cells of the outer or abaxial epidermis of the perianth lobe are bigger than that of inner or adaxial epidermis (figure 4). Some of the epidermal cells on the lateral sides elongate considerably to form bristle like structures. The inner mass consists of 6 to 7 layers of parenchymatous cells (figure 5).

The bisexual flowers have three stamens. The straight, small filaments are reniform in outline and are much shorter than the anthers. Each filament is traversed by a single vascular bundle, which extends upto the apex. The anther lobes are basifixed, ditheous and introrse (figure 7).

The gynoecium is tricarpellary, syncarpous and superior in a bisexual flower. The style is dilated with a trifid stigma which is rarely four times the length of ovary⁴.

Unisexual pistillate flowers have the same type of glumes, perianth bristles and same type of gynoecium. But, the only difference is that fertile stamens are present in bisexual flowers and staminodes in unisexual ones. The vascular supply to the long ribbon shaped staminodes persists (figure 8) while perianth lobes have no vascular supply.

Thus, in *S. grossus* L., the flowers are of two types, unisexual-pistillate and bisexual. Either, all the flowers are bisexual in a spikelet or when mixed, unisexual-pistillate at the base and bisexual at the apex.

25 January 1985; Revised 26 July 1985

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