

## The life-form of *Scaphopetalum amoenum* A. CHEV.

Životní forma u *Scaphopetalum amoenum* A. CHEV.

Jan Jeník

Department of Botany, Caroline University of Prague, Benátská 2, Praha 2

Received January 30, 1968

Abstract — *Scaphopetalum amoenum* A. CHEV. (Sterculiaceae), an endemic species of Tropical West Africa, develops a peculiar life-form which does not fit into the usual classification of woody plants. After a stage of vertical growth its main trunk curves down, the terminal twigs touch the ground, and root in the soil. New epicormis shoots arise on the top of the arch, first growing upwards, later behaving similar to the primary trunk. Gradually, a large polycormic phanerophyte is formed which might be classed as a special type of krummholz.

The description of the life cycle and life-form of a particular species is, usually, beyond the scope of plant taxonomy. This is especially true for the description of woody-plants in the Tropics. Based mostly on the short notes derived from herbarium labels, the classification of the rain-forest species is limited to a simple scheme “tree — shrub — liana”, and completed by rough estimates of the height. Except for a few economically important trees we lack data referring to the shoot and root morphogenesis of tropical phanerophytes. The pioneer work by CORNER (1940) in Malaya has not yet been followed up in other parts of the tropics.

The lowest layer of the primary rain forest in West Africa is rather uniform in structure. Besides the few herbs and broadleaved grasses, the great part of the undergrowth consists of small treelets (“pigmy trees”) which never grow very tall. Species like *Microdesmis puberula* HOOK. f. ex PLANCH., *Baphia nitida* LODD., *Psychotria* sp. div., *Pycnocoma macrophylla* BENTH., *Rinorea* sp. div., *Penianthus zenkeri* (ENGL.) DIELS, and *Ouvatea* sp. div. are very frequent. Though in the available flora (see HUTCHINSON et al. 1954—1958) many of these species are labelled as “shrubs”, in a detailed view, the true shrubs with a shoot branched at the ground level and with efficient vegetative reproduction, occur in the undergrowth of the primary rain forest only rarely. More conspicuous are patches of thickets of a woody species, identified as *Scaphopetalum amoenum* A. CHEV. which we met in several forest reserves in Western Ghana and, later, studied in the Ankasa Forest Reserve in the same region.

The Ankasa Forest Reserve comprises well preserved stands which, until recently, were inaccessible by any kind of modern transport. Farming in the close surroundings of few small villages, and hunting, were the only human interference with the natural regeneration. Possibly only casual winds and groups of forest elephants could be responsible for breaking and uprooting of smaller trees. *Scaphopetalum amoenum* occurs in the undergrowth of mixed evergreen forest composed of *Lophira alata* BANKS ex GAERTN. f., *Cynometra anania* HUTCH. et DALZ., *Tarrietia utilis* SPRAGUE, *Dialium aubrevillei* PELLEGR., *Hannoa klaineana* PIERRE et ENGL., *Daniellia thurifera* BENN., *D. ogea* (HARMS) ROLFE ex HOLL. and *Gilbertiodendron preussii* (HARMS)

J. LÉONARD. Isolated emergent trees in this forest reach a height of about 30 to 35 metres. A closed middle tree-layer consists mainly of *Drypetes aylmeri* HUTCH. et DALZ., *Irvingia gabonensis* (AUBRY-LECOMTE ex O'RORKE) BAILL., *Gluea ivorensis* AUBRÉV. et PELLEGR., *Diospyros kamerunensis* GÜRKE, *D. sanzaminika* A. CHEV., *Coula edulis* BAILL. and *Scytopetalum tieghemii* (A. CHEV.) HUTCH. et DALZ. The ferrallitic soil developed over biotite granite is classed as "forest oxysol" and has a highly acid surface layer (average pH 4).

One can easily walk in the thin undergrowth of the primary forest without using the cutlass. Occasional thickets and agglomerations of climbers are limited to small gaps created by fallen trees. Thus it was rather peculiar to find large thickets of a single species within an otherwise closed and untouched stand. A closer view suggested that the woody plant concerned represents a little known life-form unlike that of any of the other phanerophytes growing in the reserve.

*Scaphopetalum amoenum* A. CHEV. (*Sterculiaceae*) is an endemic species growing in the western forest block of the West African rain-forest zone. Hitherto it has been recorded only in Liberia, Ivory Coast and Ghana. It is a woody plant with distinctly hairy twigs and fairly conspicuous big oblong leaves which may grow to a length of 30 cm and breadth of 10 cm. A characteristic features of this species are the clustered flowers and ellipsoid 1.5 cm long fruits (compare HUTCHINSON et al. 1958, p. 315). Young seedlings grow into vertical slender poles reaching a height of about 5 to 8 metres, and a girth of about 20 to 30 centimetres. Mature stems change the direction of growth, bend down in an arch-like way, the top of the arch being at the 2 or 3 metre level. The leading branch as well as several of its upper laterals touch the soil surface. Adventitious roots develop on some of these twigs which anchor in the wet soil. From the point of rooting the apex of the leading shoot turns upwards and, subsequently, a new vertical stem is formed. A row of fresh epicormic shoots arises on the top of the arching stem. Together with some of the lateral branches they all grow strictly vertically, in negatively geotropic direction. Their foot being elevated high above the ground they give the impression of a flying stand. Repeatedly, after the mature epicormic shoots reach the size of the original mother arch, the flying stems bend down and root in the soil. Successively, a single mother plant gives rise to a large polycormic body which can cover an area of several ars. Fig. 1. gives an idea of the morphology of a part of such a "polycormon" (sensu PÉNZES 1960) of *Scaphopetalum amoenum*.

The life-form of *Scaphopetalum amoenum* cannot easily be matched with any of the units classified by DU RIETZ (1931) or ELLENBERG and MUELLER-DOMBOIS (1967). The only comparable structure is that of *Anthoantha macrophylla* P. BEAUV. (= *Macrobium macrophyllum*) noted by JONES (1955, p. 574) in a secondary forest in Southern Nigeria; the short description and a photograph attached resemble the growth form of *Scaphopetalum* fairly well. JONES (l. c.) mentioned activity of elephants in the thickets of *Anthoantha macrophylla*. Though there was no current sign of elephant activity on the locality in the Ankasa Forest Reserve, one can imagine that even *Scaphopetalum amoenum* may be a very successful competitor in secondary regrowth. MANGENOT (1954, p. 30) regards thickets of *Scaphopetalum* as a sort of degeneration following forest exploitation. Yet, the occurrence in Ghana as well as some data from the neighbouring Ivory Coast (e. g. AUBRÉVILLE 1938) suggest that our species is present in fairly untouched forests. The thick polycormons create a "dark phase" in the forest undergrowth, within which no herbs occur and natural regeneration of the emergent trees is impossible.

Although on a much bigger scale, the life-form of *Scaphopetalum amoenum* resembles the growth of certain *Rubus* species in Europe, e. g. *Rubus fruticosus*

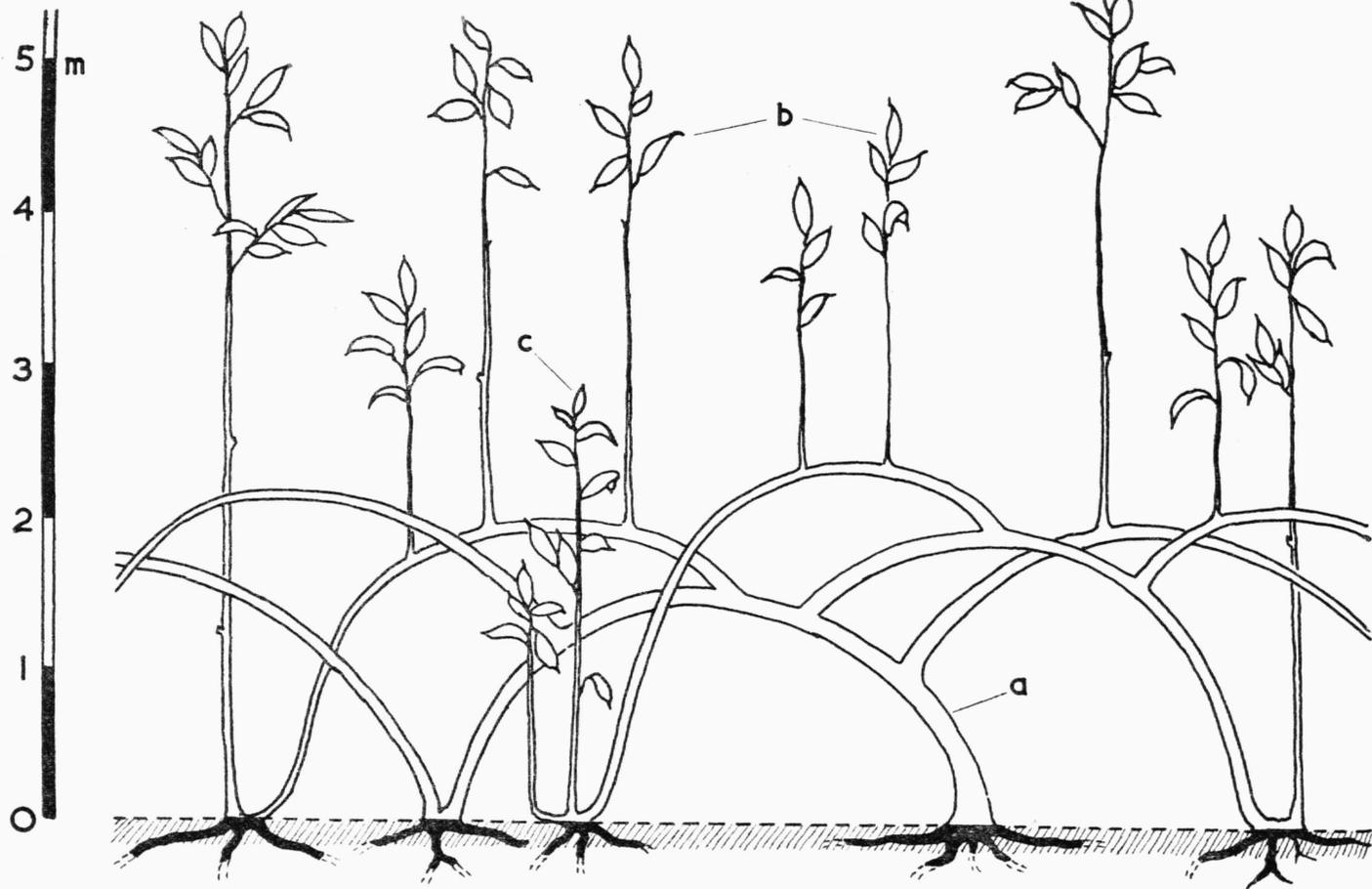


Fig. 1. — A part of a polycormon of *Scaphopetalum amoenum* A. CHEV.; a — primary mother stem; b — flying epicormic shoots; c — newly erected terminal branch of a rooted arch.

sp. col., which frequently bend toward the soil surface and occasionally root in the ground. In the tropical forests of Africa several trees develop epicormic shoots and "flying stems" on the leaning trunks, e.g. *Protomegabaria stapfiana* (BEILLE) HUTCH. and *Grewia coriacea* MAST. (for the latter example see RICHARDS 1952, p. 57). Incidental adventitious roots arise on the tree trunks which are temporarily flooded and many climbers root in the soil while creeping on the ground. However, none of these species develop genuine polycormons and possess efficient vegetative reproduction comparable with our species. If a similar life-form could be traced in some other tropical region, it may be worthwhile to establish a special life-form unit among the phanerophytes, possibly subordinated to "krummholz" in the sense of ELLENBERG and MUELLER-DOMBOIS (1967, p. 60).

Grateful acknowledgements are due to Messrs. J. B. Hall and A. A. Enti, University of Ghana, Legon, for their efficient assistance during the field studies concerned.

#### Souhrn

*Scaphopetalum amoenum* A. CHEV. (Sterculiaceae) tvoří v deštném pralese v revíru Ankasa v Ghaně zvláštní životní formu, která je na rozhraní mezi stromem, keřem a kosodřevinou. Zpočátku svislý kmen se později ohýbá k zemi a vytváří velký oblouk, který obrůstá na vrcholu výmladky a zakořeňuje terminálními větvemi v půdě. Stejným způsobem se vyvíjejí i vzniklé kmeny výmladků, takže dřevina se účinně vegetativně rozmnožuje a vytváří rozsáhlé polykormony. V podrostu pralesa tak vznikají stinné houštiny, které znemožňují přirozené zmlazování dominantních stromů.

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Recensent: S. Hejný