

Results of the botanical expedition to New Caledonia 1952 (mission "Franco Suisse")

Daenikera, a New Santalaceae Genus
Santalales-Studien II

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(with 2 figures in the text)

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On an excursion into a remote side valley of the Dumbéa river system, which is located in the Serpentine area of South-West New Caledonia, in the month of May 1951, one of us (H.H.) discovered a plant, which deviated strangely from all others he knew. Out of the ground grew a sleek but lignified stiff stalk, which soon intensively, branched off with stiffly upright and outwards sticking branches "or similar". On first view leafless, the plant has at least near the region of the inflorescence small scaly leaves "Schuppenblätter". But the strangest thing was the purple color, which all parts of the plant above the ground had. The whole shrublet reached a height of 50 cm and had many very small flower buds.

Another exploration of the same place two and a half months later resulted in the finding of one specimen with open flowers and one fruit. By an excavation it was observed, that it parasitized as a root parasite on *Myodocarpus fraxinifolius* Brong. et Gris. [Araliaceae, endemic to N. Cal.]

It was very soon clear, that this plant has never been described. According to the morphology of the flower it has been assigned to the Santalaceae, however, it could not be assigned to an already known genus. Thus, it is a type of a new genus of this family, which we dedicate in memory to our honored teacher and supporter, Prof. Dr. A.U. Däniker (1894-1957), who earned highest merits by exploring the flora and vegetation of New Caledonia.

Daenikera gen. nov.

Flores hermaphroditici (an unisexuales?), tepalis (3-)4-5 valvatis (Abb.1d), staminibus (vel staminodiis) (3-) 4-5 tepalis oppositis, antheris thecis 2 transversaliter superpositis, rima transversali a marginibus dehiscentibus, loculamentis thecarum confluentibus (Abb.1f,g,h), carpellis 2 (rarissime 3) in ovarium uniloculare, receptaculo omnino immersum, disco sublobato tectum connatis, placentia indistincta ovulis 2 (rarissime 3) textura parenchymatica immersis. Fructus drupaceus exocarpio membranaceo, mesocarpio carnoso, endocarpio tenuiter crustaceo, unilocularis monospermus; semen cum endospermio copioso, embryo indistincto.

Flowers hermaphroditic (or unisexual ?), tepals (3-)4-5 valvate (Fig. 1d), stamens (or indeed staminodia) (3-) opposite the 4-5 tepals, anther thecae 2 transverse superposed, fissure dehiscing transversely at the margin, thecal locules confluent (Fig. 1f,g,h), carpels 2 (rarely 3) in a unilocular ovary, immersed entirely in the receptacle, disk sub-lobate with fused top, placentia with indistinct ovules 2 (rarely 3) constructed of parenchyma. Fruit drupaceus exocarp membranous, mesocarp fleshy, endocarp thin, delicate, crustaceous, unilocular single-seeded; seed with copious endosperm, embryo indistinct.

¹⁾ This study has been conducted and published with support of the Georges and Antoine Claraz-Schenkung (Serie Botanik Nr. 49).

Since pollen was never found in the examined staminodia, the question of whether the described organs are functional stamens or staminodia remain open. The locule is practically reduced to two pockets by the strong construction of the wall tissue, in which the two ovules lie.

Type Species:

D. corallina sp. nov.

Frutex parasiticus ad 60 cm altus, supra copiose erecte ramosus, glaberrimus, uniformiter rufo-purpureus, ramulis articulatis, rigidis, cylindricis, nodiis paulum incrassatis et ibidem fragillimis, ± verruculosus, subtus aphyllis.

Inflorescentiae paniculatae, squamis foliosis dense subverticillatis sessilibus, 0,3-0,4 mm longis, late triangularibus, breviter apiculatis carnosus vestitae (Abb.1a), ramulis 1-13 mm 0,4-1 mm crassis.

Flores minimi, breviter et indistincte pedicellati (Abb. 1 b); receptaculum obconicum, 0,4 mm longum, supra ad 0,8 mm latum, ovarium non superans; tepala purpurea, erecta, ovata, 1-1,2 mm longa, 0,6 mm lata, carnosa, apice inflexo subcapuciformia, facie interiore pilis poststaminibus paucis articulatis vestita (Abb.1e); stamina vel staminodia basi tepalorum unita, filamentis brevibus, latis, antheris dorsifixis, 0,12-0,14 mm longis, 0,2 mm latis; discus epigynus altus, stylum erassum brevemque circumdans (Abb.1e), stigma bi-(rarissime tri)lobatum lobis crassiusculis, divergentibus (Abb.1b, i), placenta centralis columna brevi, ovulis pendentibus funiculo indistincto ex apice columnae nascentibus.

Fructus subglobosi, 2 mm longi, 1,8 mm lati, tepalis staminibus stylo stigmatibusque persistentibus coronati, exocarpio tenero, endocarpio, globoso, sublaevi, nonnihil apiculato (Abb.1k). Semen globosum, diametro c.1 mm.

Parasitic shrubs to 60 cm high, upper erect parts profusely branched, glabrous, uniformly red-purple, branches articulated, stiff, cylindrical, nodes slightly swollen and in that place fragile, ± verrucose (w/ warty projections), aphyllous below.

Inflorescence paniculate, scale leaves dense, subverticillate and sessile, 0.3-0.4 mm long, broadly triangular, shortly apiculate fleshy (Fig. 1a), small branches 1-13 mm 0.4-1 mm thick.

Flowers small, pedicelshort and indistinct (Fig. 1 b); receptacle obconic, 0.4 mm long, above about 0.8 mm wide, ovary inferior; tepals purple, erect, ovate, 1-1.2 mm long, 0.6 mm wide, fleshy, apex curved (bent), subcapuciformia (capucinus = nasturtium red), interior face clothed with small articulated poststaminial hairs (Fig. 1e); stamens or staminodia united with the base of the tepals, filaments short, broad, anthers dorsifixed, 0.12-0.14 mm long, 0.2 mm wide; disk epigynous(ly) encircling the short style (Fig.1e), stigma bi-(rarely tri)lobed, lobes moderately thick, divergent (Fig. 1b, i), central placental column short, ovules pendant from an indistinct funiculus produced from the columnar apex.

Fruit subglobosus, 2 mm long, 1.8 mm wide, tepals, stamens, style, stigma in a persistent crown, exocarp soft (delicate, tender), endocarp globose, sublaevi, in some measure apiculate (Fig. 1k). Seeds globose, diameter c. 1 mm.

Typus: Hürlimann 1586 (Mus. Bot. Univ. Turicensis).

Location: New Caledonia (endemic): Raoul o. Nr.: Sud de la Nouvelle-Caledonie (Herb. Mus. Hist. Nat. Paris, reçule19. 12. 1889);

Hürlimann 1359: Plant with flower buds, mesophytic high forest on a westerly exposed slope on serpentine ground, northern of the earlier mine settlement in the valley, beneath the mine Sunshine (North-Dumbéa), about 650 m above sea level, 9. 5. 1951;

Hürlimann 1586: Root parasite on *Myodocarpus fraxinifolius*, with flowers and fruit, at the same discovery site as 1359, 20. 7. 1951.

The shrublet (compare Fig. 2) is *sparrig* branched [branches that stick out sideways, see below]. The lower are mostly long-shoot branches which branch off at an angle of 30° to 45° and bend upwards like a bow, whereas these articulated limbs (*Artikulationsglieder*) can be up to 32 cm long. The higher up they are the shorter they become, the side shoots branch at an angle of 80°, in these way the sideways sticking-out (*sparrig*) habit comes into existence, which is also found in the inflorescences. The typical sympodial pleiochasial shoot construction is characterized by the aggregation towards the end of the articulated limbs nearly whorled (verticillate) and closely standing side shoots and a terminal axis, which continues and is well articulated. On such amassments of nodes at the ends of the axis, there are up to seven side shoots. In the lower region with branches with long-shoots, the side shoots also occur singly.

The described habit of the plant, together with its purple color, gives it a coral-like look, thus the species name *D. corallina* was given. The purple color of the plant is based on dye, which is embedded in the epidermis and the outer layers of the parenchyma of the bark which also contains chlorophyll. A similar color has, as one knows, a plant of a completely different circle of relationship, *Podocarpus ustus* Brong. et Gris, which one finds in the same area and at appropriate locations.

Wood anatomy: The small luminous vessels are simply perforated and diffusely distributed. The wood parenchym is very weakly developed, apotracheal and diffuse arranged. The plentifully found rays of mark belong to the heterogeneous type I of the classification by Kribs²), uni- and multiserate ones arise mixed and about of equivalent frequency, whereby the multiserate often have up to three, sometimes up to five collateral running cell rows.

The inflorescence is a panicle, with terminal flowers always present. The lateral flowers or side wards standing flower triads standing on there place "**on the place of the lateral flowers**" are located in the axle of a bract. The branching type is similar as in the vegetative region, the lowest internode of each axle is clearly extended, the remaining frequently in such a way shortened, that the flowers stand also often nearly whorly. Occasionally, a two-fifth position is still clearly recognized.

Within the Santalaceae-Osyrideae, *Daenikera* belongs to a group, which encompasses *Choretrum*, *Leptomeria*, *Dendrotrophe* and some related genera. In common to all is the imbedding of the placenta into the wall of the ovary, so that each ovule sits in its own bag and the unilocular type of ovary appears only at the top. The central placental column can be recognized only slightly or can be even only recognized by the vascular bundles in the tissue. The construction of the fertile stamens with four compartments, which individually open, are ±

Definition of sparrig, from Albert Blarer. Similar maybe like a flat apple tree, which spreads its branches on walls of houses, like in Sambucus nigra, in Capsicum annuum, in Atropa bella-donna etc. Word derives from a special roof construction with beams, Sparren equals a rafter, which is any of the parallel beams that support a roof in contrast to the ridgepole, which is the highest vertical timber in a roof against which the upper ends of the rafters are fixed.

arranged in a square can be found also in all those genera (in *Daenikera*, as mentioned before, fertile stamens are not yet found for sure, and the observed structure could be possibly regarded as staminodia with derived forms of anthers - only parenthetically mentioned however, is that they greatly resemble the staminodia of the South American Myzodendraceae). Also in wood anatomy this group forms a unit: shared features as diffuse vessels and the type of distribution of parenchyma, small vessels and rays of mark of the heterogeneous type I connect the genera.

Daenikera can be understood as a reduced final form (endpoint) within this group, which expresses itself particularly in the reduction of the number of the ovules down to two, the reduction of the leaves and the loss of green color.

²⁾ Kribs, D. A., Bot. Gazette 96, 547-557, 1935.

Fig.1 *Daenikera corallina* n. sp.

a) Tip of a branchlet (Astchens) from the region of the inflorescence with accumulated scale leaves (Blattschuppen). b) Flower with front tepal removed. c) Longitudinal section of a young flower. d) Diagram of a tetramerous flower. e) Tepal with anther and ampul hairs. f) Young stamen (or staminodium) from the side. g) The same from the front. h) The same from the back. i) Disk and stigma of a pentamerous flower seen from above. k) Longitudinal section of fruit.

a) after H. H. Nr. 1359. b)-k) after H. H. Nr.1586.

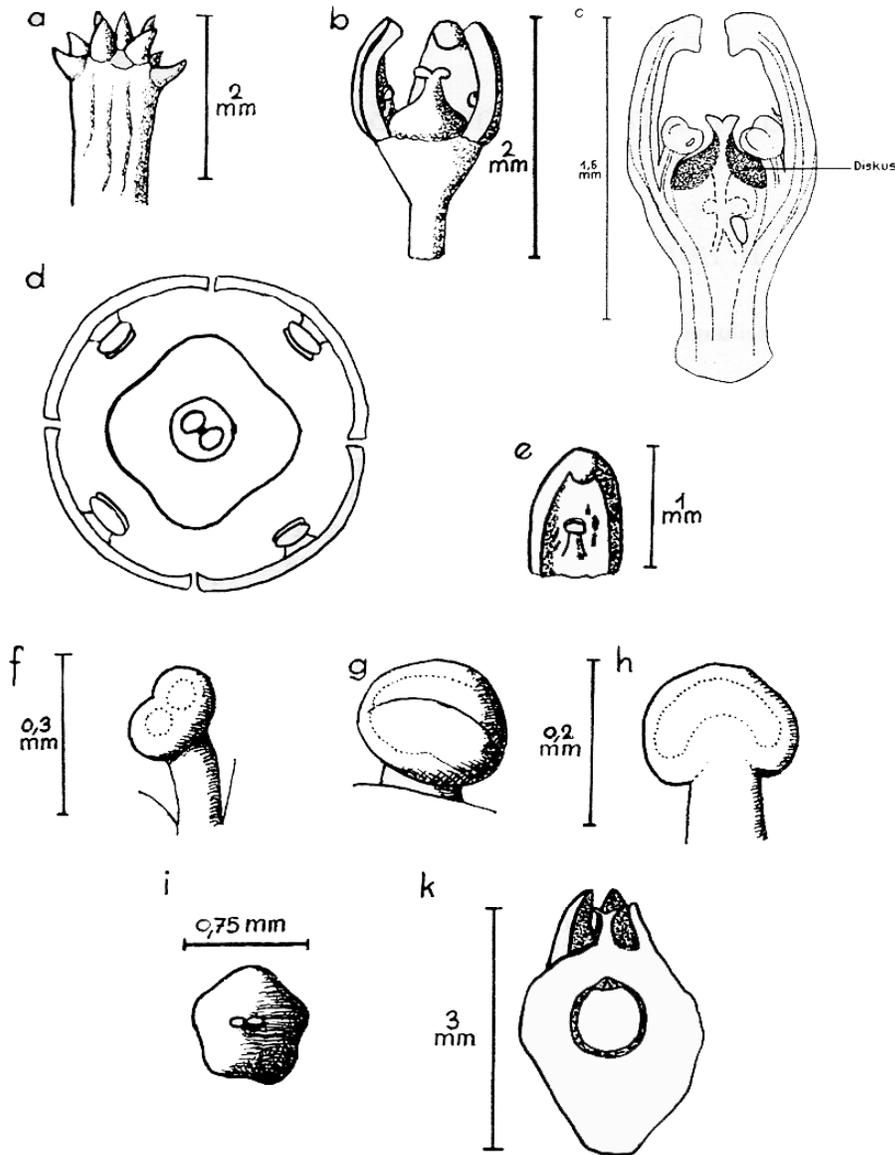


Fig.2 *Daenikera corallina* n. sp.: herbarium voucher

The three twigs arranged among each other on the left side are from H.H. Nr. 1359, all others from H.H. Nr. 1586. Note the connection with the root of the host on the two basal part of the plants in the center.

