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58th FAMILY  
**SANTALACEAE**  
**(SANTALACÉES)**  
BY  
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Trees, shrubs or herbaceous plants, often parasitic, sometimes monoecious or dioecious. Alternate or opposite leaves, whole, without stipulations, or leaves reduced to scales or nil. Varied inflorescences; regular flowers, hermaphrodite or unisexual, 3-6 flowers; bracteoles 2 or more, sometimes arranged involucre, rarely zero. Calyx fused to the ovary: lobes 3-8, valves, generally provided with a tuft of hairs behind the insertion of the stamens. Stamens the same number as the lobes, inserted at their base and opposite; anthers 2-cell with longitudinal dehiscence. Epigynous or perigynous disc, very variable. Inferior or superior ovary, unilocular; central placenta carrying at its top 2-4 hanging ovules, only one being fertile. Dry or fleshy fruit, single-seeded, often crowned by the persistent perianth; nutshell [endocarp] with homogeneous or alveolate wall; seeds globose or ovoid, without seed coat; abundant albumen, often lobed or long-streaked; embryo with superior radicle, cylindrical. Thirty genera and nearly ten species from temperate, subtropical and tropical regions: 2 genera in Madagascar.

KEY TO THE GENERA

1. Flowers without bracteoles; oval or elliptical leaves ..... SANTALUM.
- 1'. Flowers with bracteoles; leaves linear or reduced to scales or zero... 9. THESIUM.

1. **SANTALUM** L., Gen., ed. 2 (1742), 165. Sp. Pl., Ed. t (1753), 349.

Trees or shrubs. Leaves opposite or rarely alternate, entire, pinnate. Inflorescences in axillary or terminal panicles, sometimes reduced to clusters, without bracts or bracteoles. Flowers hermaphroditic. Perianth with a campanulate or ovate tube, more or less adnate at the base of the ovary, limb at 4-5 lobes free to the disc, valvate and provided inside, at the base, a bundle of hairs. Stamens 4-5, inserted at the base of the perianth lobes; short filaments; anthers oval to 9. parallel lobes dehiscent by 1 single slit. Concave disc, thin, covering the calyx tube, with fleshy lobes alternating with the stamens. Ovary first free, later will be semi-inferior then inferior, with 1 locule and 2-3 pendulous, anatropic ovules, fixed below the middle of a central placenta; style long, with 2-3 short stigmatic lobes. Drupe more or less globular, crowned with the remains of the perianth: endocarp hard and, in general, wrinkled, monospermic, seed inverted; endosperm fleshy; embryo straight or oblique, linear cylindrical, radicle much longer than the cotyledons. 12 species dispersed from tropical Asia to Australia.

1. **Santalum album** L., Sp. Pl., Ed. I (1753), 349.

Small tree. Leaves opposite, elliptical to oval-elliptical, browning on drying, glaucous below, attenuated at the base; petiole up to 1.5 cm. long, thin; blade 4.5-7.5 cm long. 1.5-3.5 cm wide. ; secondary ribs up to 8 on each side, slightly protruding. Axillary racemes, shorter than the leaves; flowers 3 mm. in diameter, dark blue or black when dry. perianth campanulate of 4 valvate lobes, triangular. Stamens 4, alternate with the lobes of the disc. Drupe globular, 1-1.5 cm. diameter, black; endocarp crustacean.

Native to India; introduced into the Malagasy region.

Comoros: Anjouan. Lavanchie s. no.

2. **THESIUM** L., Gen. Pl. (1737), 69; Sp. Pl., Ed. 1 (1753), 207

Herbaceous or suffrutescent plants, generally semi-parasitic. Leaves of variable shape, often more or less linear, or very reduced, or squamiform, or spiny. Inflorescences in clusters, spikes or panicles or often in loose or compact cymes and sometimes capituliform; floral bracteoles placed in the axils of solitary bracts. Flowers hermaphrodite; perianth superior, with receptacle enclosing the ovary, and with 5 more or less cucullate valvate segments, generally provided with a bundle of hairs placed behind the anthers and adhering to them or, if these bundles are missing, the throat of the perianth fitted with a ring at the filament insertion level. Stamens 5, inserted at the base of the segments or in the tube; filaments short, thin, anthers oval or oblong, with 2 parallel, dehiscent long locules. Often developed epigynous disc. Ovary inferior formed by 3 carpels, 1 locule, 2-4 ovules hanging from the top of a small, flexuous placenta; style cylindrical or subnub; stigma capitate or obscurely tri-lobed. Fruit dry, globular, or elliptical, or obovate, generally 10-ribbed, cross-linked between the ribs, crowned with the persistent perianth; 1 single seed in the shape of the fruit; embryo in the center of a fleshy endosperm, radicle equal to the cotyledons or longer.

About 350 species from temperate regions or tropical mountains, especially from Africa, few in America: seven species in Madagascar.

- 1. Spike-like inflorescences ..... 1. *T. madagascariense* .
- 1'. Racemiform inflorescences ..... 2. *T. Perrieri* .
- 1". Flowers solitary or in sessile cymes.
  - 2. Shrub with fastigate branches, entirely and densely covered with leaves ... 3. *T. Humbertii*
  - 2'. Plants with spreading to spreading-ascending branches, with scattered leaves:
    - 3. Shrubs with robust twigs, completely blackish in the dry state ..... 4. *T. Decaryanum* .
    - 3'. Dry shrub sub-shrubs, green-yellowish to green-glaucous:
      - 4. Twigs, leaves, flowers and fruits covered with dense hairs; very small flowers, 1.5 mm. long with perigone infundibuliform: ..... 5. *T. cystoseiroides* .
      - 4'. Twigs, leaves, flowers and glabrous fruits; flowers larger than 1.5 mm. long with non-infundibuliform perigone:
        - 5. Glabrous anthers; long style, exceeding half the length of the petals; barely visible, glabrous stigma ..... 6. *T. pseudocystoseiroides* .
        - 5'. Hairy anthers; very short style not reaching half the length of the petals; capitate stigma, hairy ..... 7. *T. Leandrianum*.

1. **Thesium madagascariense** A. DC., Prodr., XIV (1857), 652 ("Madagascarensis").

Plant annual, erect, branched above, 30-60 cm tall. ; branches spreading-ascending, angular, glabrous. Very sparse, scaly-lanceolate, rare leaves, 1-1.5 mm. long, applied and recurrent on the branches. Inflorescence in spikes formed from groups of 1-7 flowers; bracts and bracteoles ovate-acute, ciliate; bracteoles longer than bracts. 5-lobed perianth; lanceolate lobes. Stamens 5, a little shorter than the style; capitate stigma. Ellipsoid-globose fruit with well-marked longitudinal ribs on the surface, crowned at the top by the dried perigone. - FIG. I, 3-4. Edge of the marshes; peat depressions, from 1,300 to 1,600 m. alt.

SAMBIRANO; Baron 3456.

CENTER: Tapia wood, near Miarinarivo, Perrier 17614; between Ambatolampy and Tsimjoarivo, Humbert and Viguier 1752; near Antsirabe, Humbert 4632.

Endemic.

2. **Thesium Perrieri** Cavaco and Keraudren, in Bull. Soc. Bot. Fr., CII (1955), 212.

Plant subfrutescent, with spreading branched stems, twigs forming racemiform inflorescences. Leaves reduced to acute lanceolate scales, glabrous, burnish, 1.5 mm long. Flowers in cymes, themselves arranged in racemes; triangular deltoid bracts. acute. Bracteoles longer than the bracts, 3 mm long. 5-lobed perianth; lobes 2 mm long, long, glabrous, with inflected margins, cucullate. Stamens 5, inserted at the base of the perianth lobes, reaching half the length of these. Ovary 1 mm long, glabrous; 2 mm long, style exceeding half the perianth, with a capitate stigma. - FIG. I, 1-2.

Rock gardens, trachytes; Gneissic slopes, from 1,600 to 2,200 m. alt.

CENTER: N. d'Ambona, Perrier 4473 (type); near Ambatofinandrahana, Decary 13091.

Endemic.

3. **Thesium Humbertii** Cavaco and Keraudren, in Bull. Soc. Bot. Fr. , CII (1955), 211.

Plant subfrutescent, yellowish green in the dry state; branches hardy, very leafy. Crassulescent leaves, linear, 1-2 cm long. Solitary flowers at the top of leafy branches, 3 mm long. sessile; bracts linear, 7 mm long, glabrous; bracteoles shorter, of the same shape, 3 mm long. Campanulate perianth, infundibuliform, 5-lobed; triangular lobes, cucullate at the apex. Stamens inserted at the base of the perianth lobes, exceeding style; obscurely stigma. 2-lobed. - FIG. 1, 5-7.

Forest and ericoid bush, on gneisses, basalts, siliceous rocks, quartzites, from 1,100 to 2,875 m. alt.

CENTER: Tsaratanana massif, upper plateaux and high peaks (l'Amboabony à l'Antsianongatalata, Humbert 18420; Vakinankaratra province, Ambatolampy district, Mont Esiafajavona, Viguier and Humbert 1677; Ibity peak, Perrier 10687; surroundings of Ambatofinandrahana, Decary 13168; slopes of the Andringitra massif, Perrier 13695, 14427; Isalo, Perrier 16705; Beampingaratra massif, Mont Papanga, Humbert 6389; Andohahelo massif, Humbert 6199 fat 13636 bis.

Endemic.

4. **Thesium Decaryanum** Cavaco and Keraudren in Bull. Soc. Bot. Fr. , CII (1955), 212.

Plant subfrutescent, completely blackish when dry, with spreading-ascending branches. Leaves small, crassulescent, linear, 6 mm long. Flowers sessile, solitary; bracts 2.2 mm long, oblong-lanceolate; bracteoles slightly shorter, 1.5 mm long. 5-lobed perianth; oblong-lanceolate lobes, cucullate at the apex. Stamens 5, inserted at the base of the perianth lobes exceeding the style, the latter being very small, not reaching the base of the anthers; obscurely 2-lobed stigma. Fruit red, spherical, with a marked ribbed wall, rounded at the base and 2 mm long.

Gneissic slopes; from 1,500 to 1,800 m. alt.

CENTER: around Ambatolinandrahana, Decary 13235, (type); around Ambositra, remnants of wood from the western slopes at Faliarivo, Humbert 14480; Vakinankaratra province, Antsirabe district, mountain slopes west of Ambohiponana, Viguier and Humbert 1431; Ifasina, Perrier 12449.

Endemic.

5. **Thesium cystoseiroides** Bak. in: Journ. Linn. Soc. , Lond., XXII (1887), 516.

Plant subfrutescent, greenish-brownish in the dry state, with spreading branches, slender, pubescent. Scattered, crassulescent, linear, mucronulate, densely pubescent leaves,  $\pm 7$  mm long. Flowers sessile, solitary, axillary, surrounded by 2 bracteoles of the same shape as the leaves, long  $\pm 1$  mm., Densely pubescent. Infundibuliform perianth sharply narrowed at the top of the tube, densely pubescent, 1-3 mm long, 5-lobed; oval-lanceolate lobes cucullate at the apex. Stamens 5, inserted at the base of the perianth lobes, barely exceeding style: obscurely 2-lobed stigma. Fruit spherical, light brown, 2-3 mm diameter, pubescent, with whitish hairs, ribbed, crowned with persistent perianth, barely 1 mm long.

CENTER: without indication Bar on 3190 (paratype).

Endemic.

OBS. - The description made by Baker does not coincide with the type sample as regards the hairiness of the plant. Baker described it as glabrous, while it is fully and densely pubescent.

6. **Thesium pseudocystoseiroides** Cavaco and Keraudren, in Bull. Soc. Bot. Fr. , CII (1955), 212.

Plant subfrutescent, sarmentose, yellowish-brown, glabrous plant. Glabrous, linear leaves, similar to those of the previous species,  $\pm 1$  cm long. Flowers solitary, axillary, surrounded by 2 bracteoles, linear, 2 mm long. Glabrous perianth, 3.5 mm long, 2-2.5 mm wide, 5-lobed with oval-triangular lobes. Stamens 5, inserted at the base of the perianth lobes; style as long or longer than the stamens, ending in a capitate and obscurely 2-lobed stigma. Fruit ellipsoid, gray, with honeycomb wall, attenuated at the base in short stipe, 3 mm long, glabrous.

Rocky slopes, scree, rocks, bare sandstone.

CENTER: Andringitra massif (Ratsy), Roambava and Antsifotra valley and on the neighboring mountains, 2,000-2,500 m. alt., Humbert 3778 (type); Isalo plateaus to the west. from Ranohira, 800-1,000 m. of alt., Humbert 5022.

WEST: Isalo (Onilahy), 600 m. of alt., Perrier 4426.

Endemic.

7. **Thesium Leandrianum** Cavaco and Keraudren, in Bull. Soc. Bot. Fr. , CII (1955), 212.

Plant subfrutescent with spreading-ascending branches, greenish-brown. Leaves glabrous, linear, crassulescent, mucronulate, at the top. 1.5 cm long. Axillary flowers, 0.5 mm. 5-lobed perianth, not infundibuliform and not narrowed at the top of the tube, triangular and cucullate lobes at the top. Stamens 5, with very short thread; anthers longer than the nets. Very short, reduced style, ending with a capitate stigma. Fruit light brown, glabrous, crowned with persistent perianth, briefly pedicelled, 3.5 mm long. (0.5 mm long pedicel), ribbed.

Dry sands, quartzites, gneissic rockeries, sclerophyll forest remains on the western slopes, ericoid bush; basalts, siliceous rocks, umbrella forest, rhyolitic peaks; from 1,100 to 2,800m. alt. CENTER: Marivorahona massif, SW Manambato (Upper North Mahavary, Ambilobe district) Humbert 25840; Tsaratanana massif. Perrier 15371 and 16118 (Nature Reserve n ° 4), upper plateaux and high peaks, from Amboabory to Antsianongatala, Humbert 18330; mountains north of Mangindrano (upper Maevorano) to the summits of Ambohimirahavary (Mahavary-Androranga watershed), Humbert 25317: lower valley of Androranga, tributary of the Bemarivo near Antongondriha; mount Anjenabe, Humbert 24130, lower valley of Androranga, lower tributary (l'Androranga, tributary of Bemarivo, massif of Betsomanga, Humbert 23446; eastern summit of massif of Marojejy (NS) . of the upper Manantenina, tributary of the Lokolo, Humbert 22721, 23721; mount Ankaroka, SE of Lake Alaotra, Humbert 17538: Mangoro, Perrier 16885 (type); surroundings of Ankazobe, Decary 7699; N. de Betsileo, Sirabe, Hildebrandt 3584; surroundings of Ambatofinandrahana, Decary 13165; Itomampy basin, Mont Papanga, near Befotaka, Humbert 6916; Upper Mandrare basin, summit of Vavara, Humbert 6541. Endemic.



FIG. I. — *Thesium Perrieri* : 1, rameau florifère  $\times 2/3$ ; 2, fleur  $\times 10$ . — *Thesium madagascariense* : 3, rameau florifère  $\times 2/3$ ; 4, fleur  $\times 10$ . — *Thesium Humbertii* : 5, rameau florifère  $\times 2/3$ ; 6, fleur et bractées  $\times 10$ ; 7, fleur épanouie  $\times 10$ .

(58<sup>e</sup> Famille.)