these properties, substance D was inferred to be drevogenin P[5].

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Dept. of Pharmacy, Andhra University, Waltair, *January* 11, 1971.

D. VENKATA RAO.
E. VENKATA RAO.

* Equilibrium value.

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FLAVONOIDS OF *MILLINGTONIA HORTENSIS*

NOT much work has been recorded on the flavonoids of *Bignoniaceae*, a family of some 100 genera and 650 species. Harborne[1] has recorded the flavonoid distribution in about 15 plants and Sharma *et al.*[2] recently reported the isolation of scutellarein and its 5-galactoside from the flowers of *Millingtonia hortensis* Linn (Syn.: *Bigonia suberosa* Roxb.).[3-4] We have now systematically examined in detail the leaves and fruits as well as reinvestigated the flowers of this ornamental tree.[5]

Leaves.—Fresh leaves of *M. hortensis* were extracted with 80% methanol under reflux, and the aqueous concentrate, after the removal of all the organic solvents *in vacuo*, was fractionally extracted with petroleum ether and ether. The residue from the ether extract, on crystallisation from methanol, yielded a mixture of two flavones which were separated by fractional crystallisation of their acetates using ethyl acetate and petroleum ether; the more soluble fraction yielded colourless plates, m.p. 168-69° (MeOH) and the less soluble came out as colourless needles, m.p. 236-38°. On deacetylation (MeOH-HCl), the first compound gave a flavone, yellow needles, m.p. 283-85° (yield, 2%), $C_{16}H_{12}O_6$ (one methoxyl); $\lambda_{max.}$ (EtOH) 276 and 338 nm with a bathochromic shift of 15 nm with $AlCl_3$ and practically no change with NaOAc; IR (KBr) bands at 3400 (broad), 2920, 1650, 1580, 1490, 1360, 1250, 1175, 1090; 910 and 820 cm^{-1}. On methylation ($Me_2SO_4 + K_2CO_3$), it gave a tetramethylether, m.p. 162-63°. From the above data, it was identified as 6-methoxy-5, 7, 4'-trihydroxyflavone (hispidulin[6] = dinatin[7]), and the identity was confirmed by comparison with an authentic sample of hispidulin. Further, the triacetate of our pigment was directly compared with hispidulin triacetate by m.m.p., UV, IR, NMR and TLC through the kind help of Dr. W. Herz. The flavone from the less soluble acetate did not melt below 310°. From its colour reactions and R_f and preparing its tetramethylether, it was identified to be scutellarein, 5, 6, 7, 4'-tetrahydroxyflavone, which was confirmed by direct comparison with an authentic sample.

Fruits.—The pulp of the fresh pods separated from the rind was extracted with hot MeOH and the concentrate fractionated; the major flavone from the ether fraction was found to be hispidulin.

The outer rind of the fresh pods on extraction with hot 95% ethanol and concentration yielded a pale yellow solid, which when chromatographed on alumina yielded, from the chloroform eluate, colourless needles, m.p. 256-58°, $[\alpha]_D^{30} + 74°$. It answered tests for a triterpenoid and was identified as acetyl oleanolic acid by getting oleanolic acid, m.p. 306-08° and direct comparison with an authentic sample of the compound.[8]

Flowers.—The fresh flowers on complete extraction with hot methanol and fractionation yielded (*a*) from the ether fraction scutellarein as the major and hispidulin as the minor component, and (*b*) from the ethyl acetate fraction, on crystallisation from glacial acetic acid, yellow needles not melting below 300° (earlier sintering about 240°), $[\alpha]_D^{30} - 138$ (pyridine); $\lambda_{max.}$ (EtOH) 286, 338 giving a bathochromic shift of 15 nm with $AlCl_3$ and practically no shift with NaOAc; IR (KBr) bands at 3400 (broad), 2920, 1740, 1660, 1610, 1580, 1500, 1470, 1360, 1040, 905, 840 and 820 cm^{-1}. It could not be hydrolysed with 7% sulphuric acid in aqueous alcoholic medium, but on treatment with 10% sulphuric acid in acetic acid medium for 5 hours,[9] it gave a flavone, identified as scutellarein (by its colour reactions, R_f values, preparation of the acetate) and glucuronic acid. From the above data, it was identified as scutellarein.[9,10] More of the glucuronide[9] was obtained by treating the aqueous solution (after ethyl acetate) with $IN.H_2SO_4$ and keeping on a boiling water-bath for 20 minutes. We could not isolate scutellarein-5-galactoside as reported by Sharma *et al.*[2]

We are grateful to Prof. Werner Herz, Florida State University, for an authentic sample of hispidulin and direct comparison of our sample of the acetate with hispidulin triacetate, and Prof. T. R. Govindachari, Director, CIBA Research Centre, Bombay, for the spectral data, and Dr. A. Zaman, Aligarh Muslim University, for an authentic sample of scutellarein.

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LEPTOPHARYNX CHLOROPHAGUS SP. NOV. (CILIATA: PROTOZOA) FROM FRESHWATER OF WEST BENGAL, INDIA

WHILE examining a water sample from a freshwater pond of Kamarkundu, West Bengal, the author came across several specimens of the genus *Leptopharynx* Mermod which seem to belong to a new species. These specimens are bottom-dwelling sapropelic forms found amidst the bottom ooze of the sample in association with *Microthorax pusillus* Engelmann, *Cinetochilum margaritaceum* Perty and *Leptopharynx torpens* (Kahl).

Leptopharynx chlorophagus SP. NOV.
(Fig. 1)

Description.—Small, ovoid, right margin convex, left margin straight. Anterior end goes slightly beyond the left margin forming a short beak; posterior end broadly round. Length 23·1-27 μ (25 μ)*; breadth 13·2-16·5 μ (14·5 μ). Cytostome towards the left edge, just below the beak; pharyngeal basket absent. Macronucleus round or slightly ovoid, located below the middle of the body, measuring 4·5-5 μ (4·6 μ) by 3·8-4·5 μ (4·3 μ); micronucleus

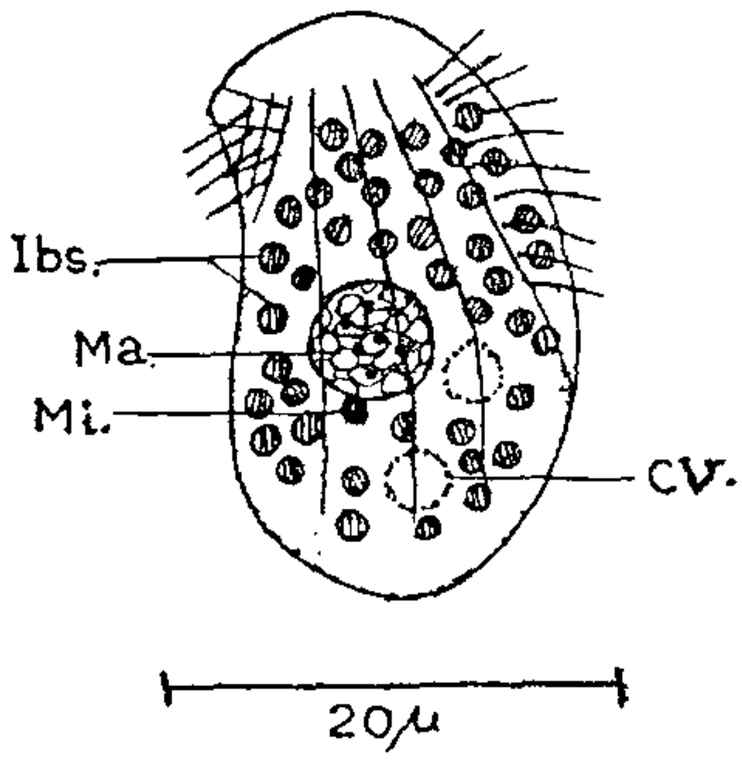

FIG. 1. *Leptopharynx chlorophagus* n. sp., dorsal view. (*Co.*—Contractile vacuole; *Ins*—Ingested bodies; *Ma*—Macronucleus; *Mi.*—Micronucleus.)

single, very small (1 μ diameter), round, placed adjacent to the posterior left of the macronucleus. Two contractile vacuoles—one little below the middle, the other near the posterior fifth of the body. Ciliation sparse throughout but little dense, though discontinuous, on the ridges. Trichocysts present. Cytoplasm heavily laden with green ingested food material which are found to be very characteristic of these forms.

Type: 11 specimens on four slides will be deposited in the Zoological Survey of India.

Type Locality: Freshwater pond in Kamarkundu (Dist. Hoogly), West Bengal.

Date of Collection: 3-9-1968; Collector: A. K. Das.

Discussion.—Among the seven species of the genus *Leptopharynx* Mermod, *viz.*, *L. costatus* Mermod, *L. sphagnetorum* (Levander), *L. opaca* (Penard), *L. euglenivora* Kahl, *L. torpens* (Kahl), *L. eurystoma* (Kahl) and *L. agilis* (Savoie) described so far, the present species resembles *L. opaca* (Penard) and *L. torpens* (Kahl) in the absence of pharyngeal basket and is more akin to the former in the nature of ciliation. But its smaller size (25 μ × 14·5 μ) in contrast to 40-50 μ length of *L. opaca* (Penard) and 60 μ length of *L. torpens* (Kahl) and cytoplasm with characteristic haematoxynophilic-ingested bodies easily differentiate it from those species. *L. opaca* (Penard) further differs from the present species in possessing usually a single contractile vacuole located below the middle of the body. *L. torpens* (Kahl)

* Figures in parenthses indicate averages.