Alkaloids of *Strychnos usambarensis* Stem Bark

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Strychnos usambarensis Gilg (Loganiaceae) is one of the three most widely distributed African species of *Strychnos* L. In East and South Africa the plant grows as a small tree 3–15 m in height. In several other localities in East Africa, as well as in Zaïre, Congo, and West Africa, it is found as a climber up to 70 m long (1). The only other morphological difference between the two forms is the presence of tendrils in the climbers.

The roots and leaves of the arborescent form are the main ingredient of an arrow poison prepared by the Banyambo hunters of Rwanda (2). In this case, the curarizing activity of the roots is mainly due to quaternary bases such as curarine, calebassine, dihydrotoxiferine, and afrocurarine, found in the root bark along with numerous other bases like usambarensine and akagerine (3–6). The leaves from the same plant have yielded 16 tertiary indole alkaloids (6, 7), mainly dimers possessing a usambarane skeleton substituted or not at C-10, C-11, or C-12. Some of these asymmetric dimers, e. g. strychnopentamine, usambarensine, and usambarine, etc., have pharmacological interest because of their antimitotic, anti-amoebic, and antiplasmodial properties (8, 9). A sample of leaves from the Ivory Coast, belonging to the climbing form of the species, has yielded only C-10 substituted usambarane-type bases; C-11 or C-12 substituted alkaloids were absent (10).

The present note reports on the isolation and identification of the alkaloids present in two samples of stem bark collected in the Ivory Coast (liane form) and in Tanzania (tree form) by Prof. F. Sandberg, Uppsala, Sweden, and identified by Dr. A. J. M. Leeuwenberg, Wageningen, The Netherlands. Voucher specimens (Leeuwenberg 7916 and 10826, respectively) have been deposited in the Herbarium of the Agricultural University, Wageningen, The Netherlands (WAG). Both samples furnished less than 0.5 % total alkaloid extract. The major alkaloidal components were identified by comparison (Co-TLC, UV, IR, MS) with authentic samples available in the laboratory (11). The composition (Table 1) appears to be intermediate between that of the leaves and roots, and once again it was noted that C-11 and C-12 substituted alkaloids were absent from the liane form. These findings are of taxonomic interest, because they show that the enzyme potential of the two forms is different, but whether the biochemical distinction is paralleled in any way by a degree of morphological differentiation that might warrant the creation of appropriately named varieties is a point that requires further investigation.

Table 1 Alkaloid composition of the stem bark of *Strychnos usambarensis* Gilg.

Liane form (Leeuwenberg 7916)	Tree form (Leeuwenberg 10826)
Harman (rb)	Harman (rb)
Fluorocurarine (rb)	–
–	Usambarensine (rb)
Dihydrousambarensine (rb)	Dihydrousambarensine (rb)
Usambarine (l)	–
Dihydrousambarine (l)	–
10-Hydroxyusambarine (l)	10-Hydroxyusambarine (l)
–	11-Hydroxyusambarine (l)
N_b-Methyl-10-hydroxyusambarine (l)	–
–	Strychnofoline (l)
–	Isostrychnofoline (l)
–	Strychnopentamine (l)
N_b-Methyl-10-hydroxycorynantheol (n)	–

(rb) = Previously found in the root bark; (l) = previously found in the leaves; (n) = First found in the course of the present work (12).

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