The tertiary alkaloids of some Asian species of *Strychnos*

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In our screening program for alkaloids, the extracts from more than 200 samples mostly from herbarium collections, belonging to 34 Asian *Strychnos* species, have been examined by t.l.c. and g.l.c. methods. The results obtained with *S. nux-vomica* L. and *S. wallichiana* Steud. ex DC. (*S. colubrina* L.) are particularly interesting in that:—

1. The alkaloid composition of the leaf and seed, irrespective of age (up to 300 years old) appeared to be unchanged.

2. Both species contained alkaloids of the following types:—Normal series: strychnine, brucine, strychnine *N*-oxide, brucine *N*-oxide; pseudo series: pseudostrychnine, pseudobrucine; *N*-methyl-pseudo series: icajine, vomicine, novacine.

3. Examination of different plant parts of the two species showed that in the root bark and root wood alkaloids of the normal series tend to predominate; in the stem bark pseudo and *N*-methyl-pseudo alkaloids are the most important; in the leaves the main alkaloids belong to the *N*-methyl-pseudo series (cf. Maier & Groger, 1968; Sefcovic, Dubravkova & Torto, 1968); and in the seeds again normal seriesbases predominate. There is evidence that in *S. nux-vomica* the normal bases are formed in the roots (Schlatter, Waldner & others, 1969). Our data from *S. nux-vomica* and *S. wallichiana* suggest that as the alkaloids are transported up the plant through the wood they are gradually converted from bases of the normal series to bases of the pseudo and *N*-methyl-pseudo series, so that when they reach the leaves the *N*-methyl-pseudo alkaloids predominate. It is possible that the reverse process may be taking place if the alkaloids descend from the leaves through the bark.

Among the other species screened were:—

1. *S. ignatii* Berg., seed samples of which gave results very similar to those of *S. nux-vomica*.

2. *S. nux-blanda* A. W. Hill, leaf and seed samples of which contained small amounts of alkaloids similar in composition to those of *S. nux-vomica* except for the frequent occurrence of diaboline.

3. *S. potatorum* L.f., which contained diaboline as the major alkaloid in the leaves, seeds, and bark.

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The conversion of *pseudo* heteroyohimbine alkaloids to oxindole alkaloids

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In the hypothesis put forward by Shellard, Phillipson & Gupta (1969) regarding the origin of oxindole alkaloids in the genus *Mitragyna*, the possibility that *pseudo* indole alkaloids could be involved was discounted because of the instability of the corresponding *pseudo* oxindole alkaloids. However, in some species of *Mitragyna* there is evidence that while *normal* oxindoles are present, the corresponding *normal* indoles do not occur although the corresponding *pseudo* indoles are present. This has led to a reconsideration of the hypothesis.

Employing the methods of Finch & Taylor (1962) and Shavell & Zinnes (1962) the *pseudo* mitrajavine has been converted to the *normal* javaphylline and isojavaphylline and the *pseudo* mitraciliatine has been converted to the normal rhynchociline and ciliaphylline. These *in vitro* conversions encouraged attempts to obtain similar *in vivo* conversion of *pseudo* indole alkaloids to *normal* oxindole alkaloids.

Young plants of *Mitragyna parvifolia* (Roxb.) Korth grown from seeds obtained from Ceylon