

Sesquiterpene Lactones from *Artemisia* Species

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(Received 9th May, 1990, revised 11th December, 1991)

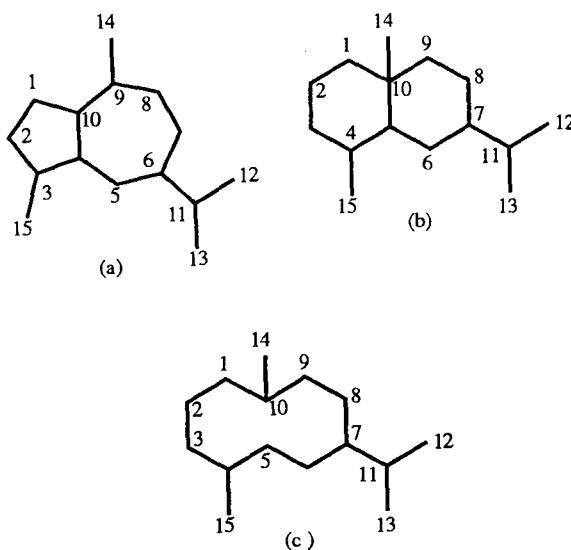
Summary: Naturally occurring sesquiterpene lactones from *Artemisia* species which appeared in the literature during the last six years (1984-1989) have been reviewed.

The plants of the *Artemisia* genus (family : Asteraceae, tribe: Anthemideae) is a rich source of sesquiterpene lactones. The extracts of a large number of *Artemisia* species have long been used in folk medicine. Several researchers have already suggested that these natural constituents may become a useful taxonomic markers within the botanical family Asteraceae (Compositae). Sesquiterpene lactones from the members of *Artemisia* have been reviewed in 1979 by Kelsey [1]. This review was very informative from the taxonomic point.

An excellent and comprehensive review by Seaman in 1983 [2] has been accomplished on the chemistry and biological aspects of sesquiterpene lactones in various members of the family Asteraceae. In the same year (1983) Fraga [3] has reviewed all natural sesquiterpenes appeared in the literature during the whole year. Recently, Ahmad *et al* [4] reviewed the chemical constituents of *Artemisia* species occurring in Pakistan.

Due to the increasing number of newly isolated sesquiterpene lactones during the last six years and to our current phytochemical research on the plants of the two genera, *Artemisia* and *Pulicaria* we have adopted the present review on this natural class of compounds from *Artemisia* during the period 1984-1989.

Sesquiterpene lactones isolated from various *Artemisia* species have mainly the following skeletons: guaiane (a), eudesmane (b) and germacrane (c). However, those lactones having skeleton a (guaianolides) and skeleton b (eudesmanolides) are the most common. It is noteworthy that recent investigation on some *Artemisia* species have shown the multiplicity of sesquiterpene lactones, for instance in *A. herb-alba*, *A. douglasiana* and *A. afra*.



Guaianolides

More than 65 sesquiterpene lactones of skeleton a have been isolated from various *Artemisia* species during the period 1984-1989. F. Bohlmann, *et al* [5] have isolated the new oily guaianolides (1-11) from the aerial parts of *A. adamsii*. The structures of these lactones were elucidated by their IR, MS and $^1\text{H-NMR}$ spectra. Of the 15 new sesquiterpene lactones isolated from *A. afra* [6], the guaianolides (16-25) (for the others, see glaucolides) have been mainly identified by their $^1\text{H-NMR}$ and by the CIMS of some of them (See Table 1). In addition, 13 known sesquiterpene lactones with guaiane skeleton have been reported from *A. afra* [6]. The polyoxygenated compound (29) has been recently isolated [10] from *A. arborescens*. Appendino and Gariboldi [9] have isolated the guaianolide (28) from the latter plant. The stereostructures of (28) and (29) were assigned on the basis of spectroscopic evidence. The closely re-