

## 25.1 Introduction

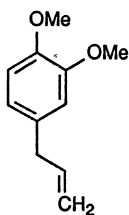
Xixin, Herba Asari, is the dry whole plant of *Asarum heterotropoides* Fr. var. *mandshuricum* (Maxim.) Kitag., *A. sieboldii* Miq. var. *seoulense* Nakai, or *A. sieboldii* Miq. (Aristolochiaceae) collected in summer or fall when the fruits are ripe. It is listed officially in the Chinese Pharmacopoeia and used as an analgesic and antitussive agent for treatment of influenza, headache, rheumatic pain, and asthma.

## 25.2 Chemical Constituents

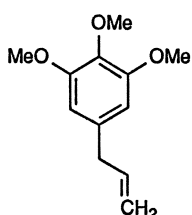
The chemical composition of the essential oil obtained from *A. sieboldii* was investigated by gas chromatography-mass spectroscopy (GC/MS). Thus, 1,8-cineole, asaricin, methyleugenol, croweacin,  $\beta$ -pinene,  $\alpha$ -pinene [1],  $\alpha$ -thujene, myrcene, terpinen-4-ol,  $\alpha$ -terpineol, safrole, and myristicin [2] were identified.

From the essential oils of other *Asarum* species used in Chinese medicine such as *A. sieboldii* var. *soeulense*, *A. forbesii*, *A. inflatum*, *A. magnificum* var. *dinghugense*, and *A. caudigerum* var. *cardiophyllum* more than 100 peaks were found and some of them were identified. 3,5-Dimethoxytoluene, safrole, methyleugenol, and elemicin were found in all species [3, 4]. In addition, longifolene,  $\alpha$ -phellandrene,  $\beta$ -pinene, limonene, bornyl acetate,  $\alpha$ -bisabolene,  $\alpha$ -himachalene,  $\alpha$ -santalene, alloaromadendrene, *p*-methoxycarbonylbenzoic acid ethyl ester, 3-isopropyl-5,5-dimethylcyclohexanone, *o*-cymene, and the alcohol of acacipetalin were detected by GC/MS from the essential oil isolated from the whole plant of *A. himalaicum* [5].

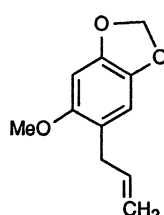
Methyleugenol (25-1), elemicin (25-2), asaricin (25-3), croweacin (25-4), and safrole (25-5) are all allyl benzene derivatives, whereas  $\alpha$ -santalene (25-6), longifolene (25-7),  $\alpha$ -himachalene (25-8), and alloaromadendrene (25-9) are sesquiterpene compounds. Acacipetalin (25-10) is a hydroxybutenenitrile glucoside.



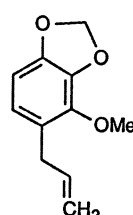
Methyleugenol (25-1)



Elemicin (25-2)



Asaricin (25-3)



Croweacin (25-4)