2.1 Introduction

Niuxi, Radix Achyranthis bidentatae is the dry root of Achyranthes bidentata Bl. (Amaranthaceae). The roots are dug and collected during winter when the above ground part of the plant has withered. It is officially listed in the Chinese Pharmacopoeia and used as a tonic.

The roots of A. aspera L., which is unofficial, have also been used in Chinese traditional medicine and folk medicine.

2.2 Chemical Constituents

Besides oleanolic acid (2-1) from A. bidentata and A. aspera [1], some insect molting substances were also isolated from the roots of Achyranthes species [2]. In a study on the biologically active compounds two insect molting hormones were isolated from A. fauriei and were identified as ecdysterone (β-ecdysone) (2-2) [3, 4] and inokosterone (2-3) [3-6]. Ecdysterone and inokosterone were also found in the root of A. bidentata [7], whereas ecdysterone was again obtained from the roots of A. aspera [2, 7, 8].

![Oleanolic acid (2-1)](image)

![Ecdysterone (β-Ecdysone) (2-2)](image)

![Inokosterone (2-3)](image)
Oleanolic acid is a triterpene compound derived from oleanane (2-4) and is widely distributed in herbal medicine. The insect molting substances ecdysterone and inokosterone are of steroid nature with a cholestane (2-5) skeleton.

Two saponins, achyranthes saponin A (2-6) and B (2-7), were isolated from seeds of *A. aspera* [9], and two saponins, achyranthes saponin C (2-8) and D (2-9), were isolated from the unripe fruits of *A. aspera* [10]. After saponification of the four saponins only oleanolic acid was determined as a sapogenin. The structures of the four saponins were also determined.