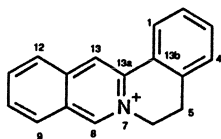


### 47.1 Introduction

Huanglian, Rhizoma Coptidis, is the dry rhizome of *Coptis chinensis* Franch., *C. deltoidea* C.Y. Cheng et Hsiao, or *C. teetoides* C.Y. Cheng (Ranunculaceae), which is collected in the fall. *Coptis* rhizome is one of the most well known and widely used herbs in traditional Chinese medicine. It is officially listed in the Chinese Pharmacopoeia and is used as a bacteriostatic, antipyretic, and antiphlogistic for the treatment of gastroenteritis, diarrhea, vomiting, icterus, fever, insomnia, hematemesis, nose bleeding, conjunctivitis, toothache, carbuncle, and abscess and as a bitter digestive for the treatment of indigestion. It is used for treatment of eczema by external application.

### 47.2 Chemical Constituents

A number of alkaloids, especially quaternary protoberberine type alkaloids, have been isolated from the rootstocks of *Coptis* species [1]. Protoberberine is 5,6-dihydro-dibenzo[*a,g*]-quinolizinium (47-1).



Protoberberine (47-1)

Early studies on the chemical constituents in the *Coptis* species native to China resulted in the isolation of berberine (47-2), palmatine (47-3), and jatrorrhizine (47-4) and some unidentified alkaloids from the rhizome of *C. chinensis* var. *omeiensis* [2]. Isolation of berberine, jatrorrhizine, and worenine (47-5) from the rhizome of *C. chinensis* var. *shihchuensis* [3], as well as the isolation of berberine, palmatine, and jatrorrhizine from the rhizome of *C. teeta* were also described [4]. From the rhizome of *C. quinquefolia*, berberine, jatrorrhizine, coptisine (47-6), columbamine (47-7), and magnoflorine were isolated and identified [5]. Berberine, jatrorrhizine, palmatine, worenine, coptisine, and columbamine are all protoberberine-type alkaloids.