

THE IDENTITY OF CANDIDINE AND QINGDAINONE

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Key Word Index—*Couroupita quianensis*, Lecythidaceae; *Isatis tinctoria*; Cruciferae; candidine; qingdainone.

Abstract—The identity of candidine and qingdainone has been established.

Indolo [2,1-b] quinazoline-6, 12-dione (**1**) [1–4] is a compound with a long history and it appears to have been obtained [5] by O'Neill as early as 1892. A few years ago compound **1** was identified as a natural product [1, 2, 6–10] from *Couroupita quianensis* and the name tryptanthrin was coined by Zähler and Fiedler [6–8]. The name tryptanthrin reflects its mode of preparation from culture solutions of the yeast *Candida lipolytica* after addition of tryptophan and anthranilic acid. In addition to tryptanthrin (**1**) Fiedler could isolate [8] indole-3-acetic acid, *N*-formylanthranilic acid and tryptophol plus an unidentified violet compound, with the composition $C_{23}H_{13}N_3O_2$, whose structure was later determined [3] by Bergman. Compound **2** was given the name candidine. Interestingly compound **2** had been briefly described [11] in 1922 by Martinet and Grosjean as a condensation product of indoxyl and **1**. Candidine has also been isolated [12] in very small amounts from blood plasma, urine and haemofiltrate of uraemic patients.

Together with the structure elucidation of candidine Zou and Huang [13] isolated and studied eight minor constituents in Qing Dai, a traditional Chinese medicine [14, 15] prepared from leaves of plants such as *Baphicacanthus cusia* and *Isatis tinctoria*. They established the presence of tryptanthrin as well as a compound given structure **2** and named qingdainone.

The identity of candidine and qingdainone has now been established by direct comparison with a sample kindly provided by Dr Huang. The two samples gave identical IR and ^{13}C NMR spectra. It is now suggested that the name candidine should be retained because,

historically, it was first isolated in 1974 from *Candida lipolytica*.

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