Chemistry of Natural Compounds, Vol. 48, No. 3, July, 2012 [Russian original No. 3, May–June, 2012]

NORDITERPENOID ALKALOIDS FROM *Consolida thirkeana* AND *Consolida sulphurea*

A. H. Mericli,[1*] Secil Yazici,[1] Esra Eroglu-Ozkan,[1] Burcu Sen,[1] Sezin Kurtoglu,[1] Hasan Ozcelik,[2] J. Zapp,[3] A. K. Kiemer,[3] and Filiz Mericli[1]

UDC 547.944/945

Delphinium and *Consolida* were formerly known as *Delphinium*, and their extracts have been employed in analgesic balms and also as sedatives, emetics, and anthelmintics. They are also known to possess insecticidal and growth-inhibiting activities [1, 2].

The genus *Consolida* is represented by 27 species in Turkey, 13 of which are endemic plants [1]. In continuation of our investigations on Turkish *Aconitum*, *Delphinium*, and *Consolida* species for their diterpenoid alkaloid content [2–10], we have now studied the alkaloids of *Consolida thirkeana* and *Consolida sulphurea*. *Consolida thirkeana* is an endemic plant growing only in Turkey, and *C. sulphurea* is a very rare plant growing only in Turkey and Syria.

The aerial parts of *Consolida thirkeana* (Boiss.) Grossh. (Ranunculaceae) were collected on Emirdag, Turkey in August 2009, and *C. sulphurea* (Boiss. & Hausskn.) P. H. Davis in Adiyaman, Turkey in June 2009. Both species were collected and identified by one of us (H.O.). Voucher specimens were deposited in the Herbarium of the Faculty of Science and Literature, Suleyman Demirel University (No: Ozcelik 12784 and 12753), Isparta, Turkey.

The crude alkaloidal extract (875 mg) obtained from 400 g aerial parts of *Consolida thirkeana* was chromatographed on a SiO_2 rotor with PE–$CHCl_3$–MeOH mixtures. From fractions 43–45, methyllycaconitine (**1**, 61 mg) was obtained. Fractions 61–65 and 72–84 were chromatographed on a Sephadex LH-20 column with MeOH, and neoline (**2**, 10 mg), 14-*O*-benzoylneoline (**3**, 9 mg), and leucanthumsine C (**4**, 4 mg), were obtained.

The crude alkaloidal extract (183 mg) obtained from 200 g aerial parts of *Consolida sulphurea* was chromatographed on a SiO_2 rotor with PE–$CHCl_3$–MeOH mixtures. Fraction 44 was purified by preparative TLC on SiO_2 with toluene–EtOAc–DEA (7:2:1) and 14-deacetylnudicaulidine (**5**, 5 mg), and browniine (**6**, 4 mg) were obtained. Fractions 58–62 were chromatographed on a Sephadex LH-20 column with MeOH and gigactonine (**7**, 16 mg), and neolinine (**8**, 8 mg) were obtained.

All the alkaloids isolated from both species are C-19 norditerpenoid alkaloids. No C-20 diterpenoid alkaloids could be isolated from both species. It is known that C-19 norditerpenoid alkaloids are much more toxic than C-20 diterpenoid alkaloid. This result shows that the investigated species are very toxic plants [11].

All compounds were identified by comparison of their ^1H and ^{13}C NMR data and CO-TLC behavior with those of authentic samples [2, 8–15].

ACKNOWLEDGMENT

A. H. Mericli thanks the Alexander von Humboldt Foundation for a fellowship.

1) Istanbul University, Faculty of Pharmacy, Department of Pharmacognosy, 34116 Beyazit, Istanbul, Turkey, e-mail: alimer@istanbul.edu.tr; 2) Suleyman Demirel University, Faculty of Science and Literature, Department of Botany, Isparta, Turkey; 3) Saarland University, Institute of Pharmaceutical Biology, P. O. 151150, 66041, Saarbrucken, Germany. Published in *Khimiya Prirodnykh Soedinenii*, No. 3, May–June, 2012, p. 471. Original article submitted January 24, 2011.

REFERENCES

1. P. H. Davis, *Flora of Turkey and the East Aeagen Islands*, Edinburgh University Press, Edinburgh, **X**, 1988, p. 17.
2. A. H. Mericli, F. Mericli, H. K. Desai, R. Ilarslan, A. Ulubelen, and S. W. Pelletier, *Pharmazie*, **56**, 418 (2001).
3. A. H. Mericli, S. Pirildar, S. Suzgec, L. Bitis, F. Mericli, H. Ozcelik, J. Zapp, and H. Becker, *Helv. Chim. Acta*, **89**, 210 (2006).
4. A. H. Mericli, S. Suzgec, L. Bitis, F. Mericli, H. Ozcelik, J. Zapp, and H. Becker, *Pharmazie*, **61**, 483 (2006).
5. F. Mericli, A. H. Mericli, H. K. Desai, A. Ulubelen, and S. W. Pelletier, *Sci. Pharm*., **69**, 63 (2001).
6. F. Mericli, A. H. Mericli, A. Ulubelen, H. K. Desai, and S. W. Pelletier, *J. Nat. Prod*., **64**, 787 (2001).
7. F. Mericli, A. H. Mericli, G. V. Seyhan, M. Bahar, H. K. Desai, H. Ozcelik, and A. Ulubelen, *Pharmazie*, **57**, 761 (2002).
8. L. Bitis, S. Suzgec, F. Mericli, H. Ozcelik, J. Zapp, H. Becker, and A. H. Mericli, *Pharm. Biol*., **44**, 244 (2006).
9. L. Bitis, S. Suzgec, U. Sozer, H. Ozcelik, J. Zapp, A. K. Kiemer, F. Mericli, and A. H. Mericli, *Helv. Chim. Acta,* **90**, 2217 (2007).
10. S. Suzgec, L. Bitis, U. Sozer, H. Ozcelik, J. Zapp, A. K. Kiemer, F. Mericli, and A. H. Mericli, *Chem. Nat. Comp.*, **45**, 287 (2009).
11. M. H. Benn and J. M. Jacino, *Alkaloids, Chemical and Biological Perspectives*, S. W. Pelletier (Ed.), Wiley Interscience, New York, **1**, 1983, p. 155.
12. S. W. Pelletier, A. M. Panu, P. Kulanthaivel, and S. D. Olsen, *Heterocycles,* **27**, 2383 (1988).
13. S. A. Ross, H. K. Desai, and S. W. Pelletier, *Heterocycles*, **26**, 2895 (1987).
14. A. Ulubelen, A. H. Mericli, F. Mericli, S. U. Kolak, H. K. Desai, and S. W. Pelletier, *Sci. Pharm*., **67**, 181 (1999).
15. H. Yan, D. L. Chen, X. X. Jian, and F. P. Wang, *Helv. Chim. Acta*, **90**, 1133 (2007).