HIGHLIGHTS IN PHYTOCHEMISTRY OF LIVERWORTS: CHEMICAL DIVERSITY AND BIOLOGICAL ACTIVITY

Yoshinori Asakawa

Institute of Pharmacognosy, Tokushima Bunri University, Yamashiro-cho, Tokushima 770-8514, Japan: asakawa@ph.bunri-u.ac.jp

Over several hundred new terpenoids and phenolic compounds have been isolated from the liverworts. Most of liverworts elaborate characteristic odiferous, pungent and bitter tasting compounds many of which show, antimicrobial, antifungal, antiviral, allergenic contact dermatitis, insecticidal, anti-HIV, superoxide anion radical release, plant growth regulatory, neurotrophic, NO production inhibitory, antiobesity, piscicidal and antitrypanosomal activity [1-4]. Most sesqui- and diterpenoids from liverworts are enantiomers to those found in higher plants. It is noteworthy that different species of the same genera such as Frullania may each produce the different sesquiterpene enantiomers.

Marchantins [Marchantin A (1), C (2)], riccardins [riccardin C (3, 4)], isoplagiochins (5, 6) and perrottetins (7, 8) and the other bis-bibenzyls from the liverworts, (Figures 1, 2) and M. paleacea var. diptera, Riccardia, Reboulia, and Radula species showed cytotoxic, anti-influenza, antitumor, antitrypanosomal and muscle relaxing activity [2-4]. The present paper concerns with the biologically active terpenoids (9-19) and bis-bibenzyls (1-8) from liverworts.
Figure 1. Oil bodies of the liverwort, *Jungermannia truncata*. 
Figure 2. Liverwort (*Marchantia polymorpha*)

References