www.thieme.de/fz/plantamedica I www.thieme-connect.com/ejournal

Planta Medica

August 2008 · Page 1 – 338 · Volume 74

9 · 2008

Topic E: Botanical/Natural Products with agrochemical interest/Natural Products in animal health care

PE1 Botanical characterization of *Maytenus senegalensis* leaf an African medicinal plant

Serrano R, Gomes ET, Silva O
iMed.UL, Faculty of Pharmacy, University of Lisbon, Av. Prof. Gama Pinto, 1649 – 019 Lisbon, Portugal

Maytenus senegalensis (Lam.) Exell (Celastraceae) is a shrub or tree, growing in the semidesertic regions of both Asia and Africa and largely used in traditional medicine [1]. The leaf is used in East Africa to treat different diseases such as inflammations, respiratory diseases and sores [2]. Triterpenes and phenol compounds were detected on the leaf and *in vitro* antiplasmodial, antileishmanial and antibacterial activities were reported for this part of the plant [3, 4]. Hereby we present the results of a morphologic and anatomic study conducted in order to identify useful markers for the diagnosis of this medicinal plant as an herbal drug. Used methodology includes the macroscopic and microscopic analysis of the whole, fragmentised and powdered dried leaves. The observations were performed in a minimum of 30 adult leaves. Additionally, scanning electron microscopy was used for plant material characterization. Results showed that among the most useful characters for leaf identification are the isobilateral organization of the parenchyma, with palisade parenchyma on both epidermises; the presence of calcium oxalate cluster crystals, isolated or inserted into the palisade parenchyma; and the characteristic epidermal cells with sinuous walls, a smooth cuticle and paracytic stomata more frequent in lower epidermis. Obtained results allowed the establishment of the botanical criteria essential for the *M. senegalensis* leaf identification and should be included in the quality control monographs of this medicinal plant. References: 1. Kokwaro, J. O. (1976) Medicinal Plants of East Africa. East African Literature Bureau. Nairobi. 2. Maytenus senegalensis (Lam.) Exell (2008) in: http://www.metafro.be/prelude 3. El Tahir, A. et al. (1999) J Ethnopharmacol 64:227 – 233. 4. Hussein, G. et al. (1999) Phytochemistry 50:689 – 694.

PE2 Acute, subacute and dermal toxicology of the bioinsecticide from *Stemona tuberosa* Lour

Wongcome T[1], Khonsung P[1], Jatisatien A[2], Dheeranupatana S[2], Panthong A[1]
[1]Department of Pharmacology, Faculty of Medicine, Chiang Mai University, 110 Inthawarorod road, Tambon Srephum, Amphor Muang, Chiang Mai, 50200, Thailand; [2]Department of Biology, Faculty of Science, Chiang Mai University, Chiang Mai, 50200, Thailand

A formulation of bioinsecticide from *Stemona tuberosa* Lour (Family Stemonaceae) marketed in Thailand as Biopes, is used in agriculture by the farmers in the northern area of Thailand. Consequently, insecticide used for insect control is common and may lead to pesticide toxicity to the consumers as well as to the farmers. The aim of the present study is to evaluate the safety of Biopes (containing 20% W/W of Stemona crude extract) to mammals. Safety assessments included an acute oral toxicity test [1] and a repeated dose 90-days oral toxicity test [2] in Wistar rats, and acute dermal irritation test [3] in guinea pigs. In acute oral toxicity test, the marketed Biopes product showed lethal effect with the LD50 of 1,078.95 and 630.96 mg/kg body weight in male and female rats, respectively. In the 90-days oral toxicity test at the dose of 80 and 140 mg/kg body weight (50 and 100 folds to the concentration used in agriculture), there were minimal but significant differences in body weight gain, some values of hematology, blood biochemical indices, and organ weights between control and treated groups. The histopathology findings indicate small toxic effects of Biopes to gastrointestinal tract, lung and liver of the treated rats. In dermal irritation test, the direct exposure to non-diluted Biopes caused irritation on the skin, and might be harmful to the users. However, although the diluted solution of Biopes at the concentration used in agriculture can cause the dermal irritation, but it was slight and improved within the short period. All the above results demonstrated that Biopes has low toxicity and low dermal irritation to laboratory mammals and therefore could be regarded as safe for use as an insecticide. *Acknowledgments: Department of Environmental Quality Promotion, Ministry of Natural Resources and Environment, Thailand.* References: 1. OECD (1981). OECD Guidelines for Testing of Chemicals: Acute Oral Toxicity. 2. OECD (2001). OECD Guidelines for Testing of Chemicals: Repeated Dose 90-day Oral Toxicity Study in Rodents. 3. OECD (2002). OECD Guidelines for Testing of Chemicals: Acute Dermal Irritation/Corrosion. The Organization for Economic Co-operation and Development.

PE3 The effect of different levels of vermicompost and irrigation on morphological properties and essential oil content of German chamomile (*Matricaria recutita*) C.V. Goral "

Azizi M[1], Rezwanee F[1], Hassanzadeh Khayyat M[2], Lackzian A[1]
[1]Ferdowsi University of mashhad, Iran; [2]Medical science university of mashhad, Iran

German chamomile (*Matricaria recutita* (L.) *syn. Chamomilla recutita* (L.) Rauschert) is one of the most important essential oil bearing plants that belong to *Asteraceae* family. Its essential oil (Chamazulene, Bisabolol and Bisabolol oxide A,B) is used in different medicinal industries. In this research, effects of different levels of vermin-compost and irrigation have been evaluated on morphological characteristics and essential oil content of "Goral", an improved German chamomile. The research has been conducted in pot and greenhouse system. The treatments included four amounts of vermicompost (0, 5, 10 and 15% w/w) and three irrigation regimes (2 mm per week, 4 mm per 2 weeks and 2 mm per 2 weeks). The studied factors were flower dry yield, plant height, day need to flowering time, anthodia height, anthodia diameter, oil content (%) and essential oil yield. Vermin-compost application improved plant height, early flowering, flowers dry weight, anthodia height and diameter significantly. Irrigation also affects plant height, flower dry weight and flowering time significantly. 2 mm irrigation per two weeks was the best method and 2 mm irrigation per week increased anthodia height and diameter significantly. The interactions between vermicompost and irrigation was significant with respect to plant height (64.82 cm), flowers dry weight (7.84 gr per pot) and flowering time (35.5 days) as concerned and the best treatments was 15% vermicompost and irrigation 2 mm per two weeks. The highest essential oil yield detected in 10% vermicompost and irrigation 4 mm per two weeks (2/23 mg/pot). According to the results, 15% vermicompost plus 2 mm irrigation per two weeks was the best method to produce the Goral cultivar of German chamomile in organic system.

PE4 Effects of irrigation frequencies and planting density on herbage biomass and oil production of Thyme (*Thymus vulgaris*) and Hyssop (*Hyssopus officinalis*)

Khazaie HR[1], Nadjafi F[2], Bannayan M[3]
[1]Ferdowsi University of Mashhad, College of Agriculture, Mashhad, Iran; [2]Medicinal Plants and Drugs Research Institute, Shahid Beheshti University, Tehran, Iran

An experiment was undertaken to determine the herbage biomass and oil production of thyme (*Thymus vulgaris* L.) and hyssop (*Hyssopus officinalis* L.) in 2003 and 2004 in the semi-arid region of Khorasan in Iran. The experiment was a split plot with three irrigation intervals as main plots and three planting densities as subplots, all of which replicated three times. Irrigation intervals consisted of 7, 14, and 21 days for both crops and planting densities of 6.6, 8, and 10 (plants.m^{-2}) for thyme and 5, 6.6, and 8 (plants.m^{-2}) for hyssop. Different planting densities were employed by changing planting distances on cultivation rows. Herbage biomass and oil production of shoots, harvested at flowering were measured as annual production of each crop. Irrigation intervals did not change total harvested herbage biomass and oil production of both crops. Averaged across both years of the experiment, thyme produced higher oil than hyssop. Both crops produced higher biomass and oil in the second year of the experiment compared to the first year. While thyme plants biomass and oil productions were lower at the highest planting density, hyssop plants showed no response to planting density. Herbage biomass and oil production of hyssop did not show a clear trend in response to interaction of irrigation intervals and planting densities in both years of the experiment. Our results showed that there is a high potential for saving water through longer irrigation intervals (e.g. 14 days) using locally adapted plants in the semi-arid conditions of Khorasan. These crops could serve as alternative sources of income in dry years. References: 1. Azam-Ali, S.N. et al. (2001) Exp. Agric. 37: 433 – 472. 2. Bannayan, M. et al. (2008). Ind. Crops Prod. 27: 11 – 16. 3. Craker, L.E. and Dinda, K., (2000) Growers Guide to Medicinal Plants. p.103, HSMP Press Pub., Amherst, USA.