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Detailed pharmacological studies of the new phytochemical PITC-2 of medicinal plant *Pluchea indica* (L) Less

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Medicinal value of plants has been significantly rewarded by Indian research background, although ancient reports based screening has been enormously persuaded. Based on the experimental evidences and statistical screening many interesting physiological properties were shown by Indian medicinal plants resulting in the isolation of clinically useful compounds. The target of a pharmacologist is to find out a significantly effective compound of better activity with negligible or no side effects. Modification of the existing drugs or by discovering a lead compound can help to achieve the goal. Active engagement in the evaluation of Indian medicinal plants used in traditional medicinal system, over the last few years have discovered that the plant *Pluchea indica* (L) Less root possesses anti-inflammatory, anti-ulcer and anti-oxidant properties. The present study involves the evaluation of some pharmacological activities, i.e., anti-malarial, anti-microbial and anti-leishmanial both *in vitro* and *in vivo* by employing the tissue cultured *P. indica* root extract, PITC-2 (isolated compound) and its derivatives. As our previous study indicates, it is safe to use in biological system as it possesses a wide range of therapeutic window. PITC2 may be a potential lead to design a new drug against MDR malaria strains. It may be concluded that PITC-2 was not only an active antibacterial agent but also is able to interfere with and restrict the action of polymerase chain reaction for rebuilding of new DNA strands. The anti-leishmanial activity of the crude extract, PITC-2 and its derivative proved to be rather significant and promising as well with the IC50 values of <20 µg/ml

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Male apomixis-Towards the synthetic engineering of clonal seed formation in plants

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Apomixis is a specialized form of plant reproduction in which clonal seeds are formed through a short-circuiting of the female sexual pathway. Due to its ability to fix genotypes over successive generations, apomixis is considered the Holy Grail for plant breeding particularly in the view of hybrid fixation and polyploid stability. Although apomixis is a natural occurring phenomenon, it has not been retrieved in major cropspecies. Hence, current research is focused on the genetic engineering of apomixis and on the identification of genes that underlie its major developmental components including female apomeiosis and parthenogenesis. Here, we present an alternative method to genetically engineer clonal seed formation in plants; namely 'male apomixis'. Basically, in this process, male meiosis is converted into a mitotic division and resulting clonal pollen are used to fertilize eggs that selectively eliminate their own genome input. In plants, parent-specific genome elimination (GE) can be obtained by uniparental alterations in the centromeric chromatin status (CENH3). Male apomeiosis, on the other hand can be achieved by eliminating both meiotic recombination and reductional cell divisionas for example by the combined loss of AtSPO11-1 and JAS. By using resulting 2n atspo11-/-jas-/- pollen in the fertilization of a GE line we obtained diploid progeny plants genetically identical to the pollen donor. Although the efficiency of clonal seed formation is rather low, these findings demonstrate that the combined loss of two genes can confer male apomeiosis and hence provides a molecular basis for the synthetic engineering of 'male apomixis' in plants.

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