

Bioprospecting of “New” or “Old” Plant Species?

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Plant diversity still offered major opportunities for finding new substances for development novel pharmaceuticals. However, it is estimated that only a small percentage (less than 3%) of all currently known plant species have been chemically investigated. On the other hand, more than 60% of the available anticancer drugs were directly based on or developed from natural products. Screening of plant materials has become an important tool in discovery of new sources of biologically active compounds that are active against a wide range of assay targets. New compounds are to be described from poorly studied species and even in species that are considered chemically well known, new chemical strains are still detected. Bryophytes represent a poorly explored part of biodiversity. Milestone investigations on bryophytes are attributed to Japanese researcher Asakawa and his colleagues [1,2]. A global approach on Bryophyta investigations appears to be essential in developing new and viable biotechnological processes which could be afford suitable amounts of unique compounds. Another group of organisms that provides very promising sources of bioactive substances with potential anticancer, antiviral, antibacterial, antiparasitic, antiinflammatory, antihyperglycemic, epatoprotective, and cardioprotective activities are lichens and mushrooms [3,4]. Approximately 300 species are known to have medicinal activity and another 1800 species have been identified with potential medicinal properties [5]. The huge biological diversity of lichens that maintained by 18800 different species [6], is highly promising source of unique secondary metabolites and polysaccharides of which some have already been proved to be effective against various cancer *in vitro* models [7].

The target species for detail evaluation are selected concerning the pharmacological significance in local and international scales. The search for plants with antimicrobial activity has gained rising importance in recent years, due to a worldwide concern about the alarming increase in the rate of infections by antibiotic-resistant microorganisms. The probability of finding new candidates for pharmaceutical exploitation from ‘megadiverse’ tropical and subtropical countries is higher than from other poorer vegetation zones. Despite of high evaluation and numerous published papers some plants are of high priority research, for example *Hypericum* species. The arising question is about the meaning of such continuous investigations on the well-known genus and species.

Hypericum genus is one of the 100 large angiosperm genera that comprise an estimated 22% of angiosperm diversity [8]. Recently, *Phytotaxa* represents the final taxonomic part of a worldwide monograph of the *Hypericum* genus (approximately of 480 species), produced by Dr. Norman Robson from the Natural History Museum in London [9]. *Hypericum* monograph provides not only valuable tool for the identification of taxa but also a rich resource for research of many other aspects of the biology of the genus.

Despite the large number of *Hypericum* species, undoubtedly, only *H. perforatum* L. has been studied in depth as pharmaceutical important medicinal crop plant. *H. perforatum* has received considerable interest from scientists, because it is a source of at least ten classes of biologically active detectable compounds which demonstrated antioxidant, antiviral, antifungal, anti-HIV, antidepressive or anticancer properties

[10,11]. The success of the plant especially related for using one to treat depressive disorders. In the last few years the investigations on other *Hypericum* species rise up too but are still limited. Only small part of genus diversity (about 90 species) more or less was bioprospecting for useful substances. Recently, a new compound: 2,7,4a-trimethoxy-1,4,4a,8b-tetrahydrodibenzo-p-dioxin-4-one, was isolated from the aerial parts of the *Hypericum reptans* Hook f and Thomson [12]. The species is widely distributed in the grassy slopes, rocky places, streamside at forest edges of southeast of Tibet and Northwest of Yunnan in China [13]. It is difficult to predict a value of compounds found in a plant without following deep biological evaluation.

The bioassay of stem bark extract from *Hypericum lanceolatum* Lam., used by traditional healers in Cameroon, indicated some new metabolites with anti-plasmodial activity [14]. The species could be considered as a potential source of new anti-malarial phytomedicines.

The diversity of poorly researched plant groups’ is of major priority for bioprospecting useful chemical agents for new pharmaceuticals. On the other hand, even highly investigated genus like *Hypericum* could assume as potential sources for further assay of bioactive compounds with not predictable bioactivity.

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