ALLELOCHEMICALS AS POSSIBLE FLUORESCENT PROBES

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Some allelochemicals, belonging to phenols, alkaloids, terpenoids, can fluoresce at the excitation of ultra-violet or violet light (1-4). In our experiments with crystallic and solved (in a dependence on their solubility in water, ethanol, chloroform) substances, flavonoids quercetin and rutin emitted in blue region of the spectrum (with maxima 465-470 nm and 590-600 nm), alkaloids glaucine, physostigmine and berberine – relatively in violet-blue (410-470 nm), (410-470 nm), and green-yellow region with maxima 520nm, alkaloids rutacridone and sanguinarine – in orange region (585-600 nm), sesquiterpene lactones ledol, artemisine, santonine, gelenine, scoparone, inulicine, deacetylinulicine, taurine, tauremisine, gaillardine and grosshemine - in violet-blue (410-470 nm), polyacetylenes capilline and cicutotoxin – relatively in blue (450-470 nm) and orange (580 nm).

The fluorescence induced by ultra-violet light has been also observed both in intact secretory plant cells enriched in the substances and excretions from the cells. For instance, brightly orange light emission was peculiar to root idioblasts of *Ruta graveolens* , which contain acridone alkaloids, especially for rutacridone, to laticifers of *Chelidonium majus*, including alkaloid sanguinarine whereas blue fluorescence - to most studied sesquiterpene lactones located in secretory cells of leaves and flowers of genus *Artemisia*. The substance fluorescence may serve as a marker for the cytodiagnostics of the secretory structures in luminescent microscope (they are not seen in usual microscope without special histochemical staining).

When the pure fluorescent substances (10^{-6}-10^{-5}M) were added to the cell-acceptor (pollen of *Hippeastrum hybridum*) that were served as modelling of allelopathic interactions, the changes in their fluorescence could be seen. Alkaloids, which have the anticholinesterase activity, such as physostigmine, berberine and sanguinarine concentrated and fluoresced with orange colour on the surface of the cell. Pollen germination in artificial nutrient medium decreased after the addition of berberine and sanguinarine. As for alkaloid rutacridone and sesquiterpene lactones gaillardine and grosshemine, which inhibited the pollen germination, they passed through plasmalemma into the cell and nucleus became green fluorescent (rutacridone) or blue lightening (sesquiterpene lactones). The substances also reacted with DNA or nucleic acid-protein complexes, inducing similar fluorescence. The compounds may be used in the studies of the mechanisms of the allelochemical action as fluorescent probes.

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