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EDITORIAL

Editorial

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Dear Colleagues,

This issue of Journal of Planar Chromatography (JPC) is the first in 2021 and includes a review on green solvents and nine original research papers. The research papers all address the topic on standardization of plant-based formulations. All publications are written by leading scientists in the field of high-performance thin-layer chromatography (HPTLC) and thin-layer chromatography (TLC).

The current issue begins with a review on green solvents. A solvent is considered green if it is safe for the user (*i.e.*, the solvents are not carcinogenic, mutagenic, and generally non-toxic), if it is safe to use (*i.e.*, the solvent is not flammable, explosive, does not have a high vapor pressure, strong odor, or potentially forms peroxides), and if it is safe for the public and the environment (*i.e.*, the solvent is not ecotoxic, persistent, shows no ozone depletion or global warming potential). A green solvent should also be inexpensive, easy to handle, and recyclable. The review **"Applications of green solvents in thin-layer chromatography (TLC)—An overview"** by *Qasim Ullah, Salman Ahmad Khan*, and *Ali Mohammad* presents the work that had been done on the use of green solvents like ionic liquids, surfactants, deep eutectic solvents, or biobased solvents in TLC from 2005 to 2019.

Polyherbal formulations are gaining more and more importance as soft and natural kind of medication. Unfortunately, the plant material varies in its chemical content and thus in its therapeutic effects. This is affected by different batches of collection due to different seasons and/or collection from sites with different environmental surroundings or geographical location. When plant material is used in large quantities, standardization of polyherbal formulations is an essential factor to guarantee the quality of the drugs. This can be done based on the concentration of their active principles. Efforts are being made to establish standardizations for every herbal drug on the market. The present issue specifically addresses this topic as HPTLC is well suited to standardize polyherbal formulations. The method is capable of separating up to, say, six substances, which is usually sufficient to standardize a polyherbal formulation. Most often one marker substance is quantified per herbal content in bulk and later on in the formulation to achieve a constant concentration of the active principle in the drug.

In the work **"Standardization of Cardimap tablet using multiple markers"** by the group of *Monika B. Sangani*, the marker substances reserpine, lupeol, scopoletin, bacoside A, and piperine were used for standardization.

The publication **"Simultaneous estimation of four different biomarkers in *Cinnamomum verum* J. Presl bark using a validated high-performance thin-layer chromatography method"** by *Abhishek Gupta et al.* uses the compounds salicylic acid, kaempferol, gallic acid, and protocatechuic acid as marker compounds. In the work **"Qualitative and quantitative analyses of labiatenic acid, apigenin and buddleoside in *Hyssopus officinalis* by high-performance thin-layer chromatography"** by *Li Li et al.*, the compounds rosmarinic acid, apigenin, and buddleoside were used for standardization. In the paper **"A developed thin-layer chromatography method for the determination of genistein-7-O-[α-rhamnopyranosyl-(1 → 6)]-β-glucopyranoside in *Derris scandens*,"** the group of *Panadda Phattanawasin* quantified the compounds genistein-7-O-[α-rhamnopyranosyl-(1 → 6)]-β-glucopyranoside and genistein for standardization.

Quercetin is a well-known plant flavonol found in many fruits, vegetables, leaves, seeds, and grains, making it well suited for herbal drug standardization. The following two publications describe just that: the use of quercetin as a marker compound. In the paper **"Simultaneous quantification of four active metabolites in *Psidium guajava* L. by a validated high-performance thin-layer chromatography method,"** the group of *Surabhi Tiwari* quantifies the compounds quercetin, gallic acid, eugenol, and beta-sitosterol, while *Mohammad Khalid et al.* describe an **"A high-performance thin-layer chromatography method for the**

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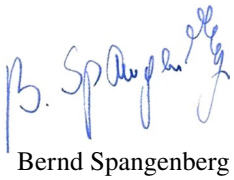
simultaneous determination of quercetin and gallic acid in *Eclipta alba* and *Guiera senegalensis*" using quercetin and gallic acid as drug markers.

The paper **"Separation and quantification of lupeol in *Hygrophila schulli* by high-performance thin-layer chromatography"** by *Balu Ghule et al.* describes the quantification of lupeol for quality control of *Hygrophila schulli* using HPTLC. Post-chromatographic derivatization was performed with anisaldehye−H_2SO_4 reagent, and chromatograms were scanned at 540 nm.

The combination of chromatographic separation with the application of staining reagents results in a colored band pattern unique to different drugs or drug mixtures. These profiles can be used to identify and authenticate genuine crude drugs without quantitative marker analysis. The paper by *Mary C. Boyce et al.* entitled **"Development of a high-performance thin-layer chromatography method for the analysis of Kakadu plum"** is a typical example of this kind of qualitative and comparative analysis.

The final paper of this JPC issue describes the **"Phytochemical analysis and simultaneous quantification of solasodine and diosgenin content in different parts of *Solanum xanthocarpum* Schrad. & Wendl. by a validated high-performance thin-layer chromatography method"**. The authors are *Mridul Kant Chaudhary, Ankita Misra*, and *Sharad Srivastava.* Here, the compounds solasodine and diosgenin were used for drug standardization.

The current JPC issue shows that due to its speed, high throughput, and cost-effectiveness, HPTLC is preferred for the analysis of herbal drugs and for their standardization.



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