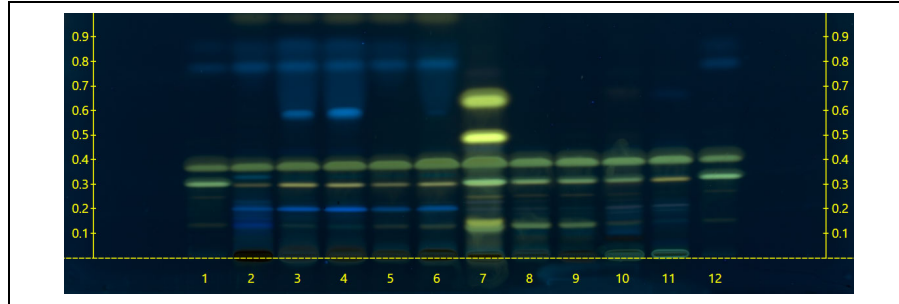


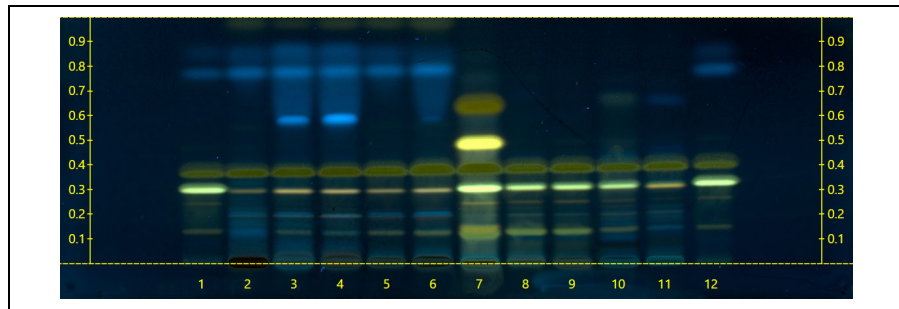


**Certificate of Analysis: Goldenseal Root (25522-C)**  
High Performance Thin-Layer Chromatography with Photo-Documentation

1



2



**Company Name:** Mountain Rose Herbs  
**Title:** Goldenseal Root  
**Plant Part:** root  
**Appearance:** Yellow/Brown Pieces  
**Sample Packaging:** Clear Reclosable Plastic Bag

**Sample Received:** 08/03/21  
**Form of Botanical:** whole/dry  
**Lot Number:** (25522-C) → Lanes 5(5µl), 6(10µl)  
**Sample:** 21215UKK\_2

**Latin Name:** *Hydrastis canadensis* L. [Ranunculaceae]  
**Reference Sample:** Lane 2(10µl) (M25718HH2) *Hydrastis canadensis* (herb (leaf, stem)); Lane 3(10µl) (M35301AHP), Lane 4(10µl) (M25718HH1) *Hydrastis canadensis* (root); Lane 7(10µl) (R33401PB) *Coptis chinensis* / *Huang Lian* (root); Lane 8(10µl) (P32613BH1) *Berberis vulgaris* (root); Lane 9(10µl) (HK00914HVDA1) *Berberis aristata* (root bark); Lane 10(8µl) (HI32316AHP1) *Phellodendron amurense* (bark); Lane 11(5µl) (JU23014KAN1) *Phellodendron chinense* (bark); held at Alkemist Labs, Garden Grove, CA.

**Analyst:** A. Davis, N. Afendikova, M. Edwards, S. Kabbaj, N. Hoang, K. Tran, J. Lopez, J. Mares 160296  
**Sample Preparation:** 0.03g+3mL 50% Methanol, sonicate/heat at 50°C for 30 min.  
**Stationary Phase:** Silica gel 60, HPTLC plates  
**Mobile Phase:** Toluene: Ethyl Acetate: Methanol: Isopropanol: Water: Ammonia (rear) [6/3/1.5/1.5/0.3/10]  
**Detection:** (1) 10% Sulfuric, 100°C, 2min, 366nm (Reich, E., 2007)  
(2) 10% Potassium hydroxide, 366nm (Reich, E., 2007)

**Reference Standard:** Lanes 1(1µl) and 12(1µl) Hydrastine (00008350-327, CHR), Berberine Chloride (605, CHR), Methanol (0000272442, VWR), Palmatine Chloride ( ), Hydrastine (85963619, Phyto), Berberine Chloride ( ), Methanol (0000272442, VWR)

**Reference Source:** AHPA  
IDT-SOP-72-01

**Comments & Conclusions:** Lanes 5, 6 are the test sample Goldenseal Root (25522-C). Lanes 2, 3, 4, 7, 8, 9, 10, 11, are the reference samples used for comparison. This test sample, Goldenseal Root (25522-C) is consistent with the chromatographic profile of the reference samples of *Hydrastis canadensis*, used above. **This test sample Goldenseal Root (25522-C) has characteristics of *Hydrastis canadensis* root.**

**NOTE:** The above conclusion may be a function of the natural variance found in botanicals &/or the extraction process used to create specific extracts. The growing and drying conditions, age, seasonal variations, geographic location, extraction solvents, etc. all play a role in the phytochemical fingerprint of botanicals as well as their extracts; hence, chromatographic variations are expected.

Examined, Reviewed & Authorized by: Khanh N Tran, HPTLC, R&D Supervisor, Alkemist Labs

Report Date: 08/10/21



Note: Any unidentified lanes in the above chromatograms are confidential and may represent internal studies or other test samples not related to 25522-C. This report applies to the sample investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. This report is for the exclusive use of the party who requested the report and not for public dissemination or use by third parties, including for promotional purposes, without the prior written permission of Alkemist Labs, Inc. This report provides technical results for a specific sample and the report shall not be altered, modified, supplemented or abstracted in any manner. Any violation of these conditions renders the report and its results void. © 2021 Alkemist Labs, Inc. All Rights Reserved