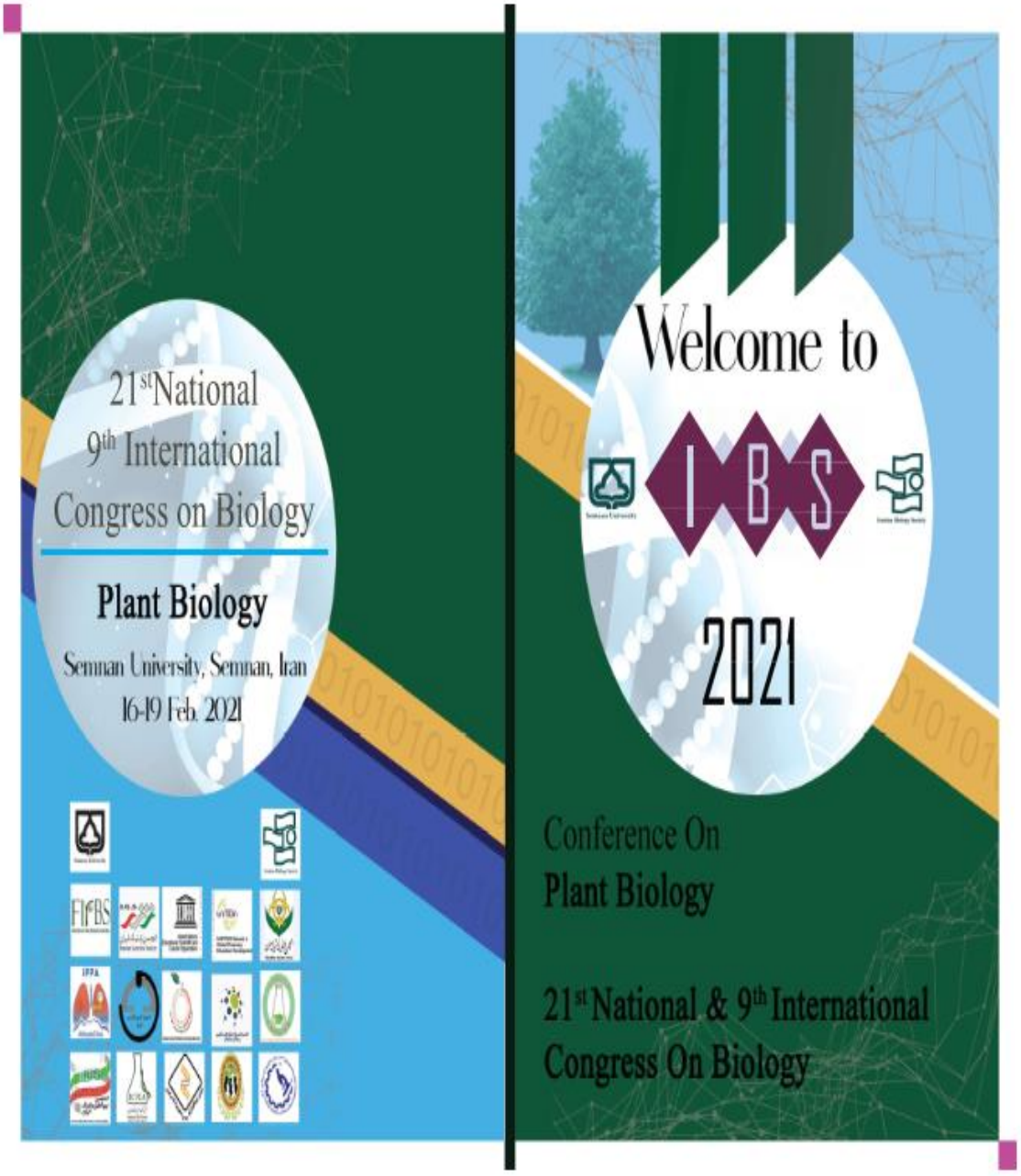
21st National
9th International
Congress on Biology
Plant Biology
Semnan University, Semnan, Iran
16-19 Feb. 2021
Welcome to
IBS
2021
Conference On
Plant Biology
21st National & 9th International
Congress On Biology

PP157 Comparison of phenolic compounds in different organs of three populations of *Salvia abrotanoides* (Kar.) Sytsma in Khorasan Razavi province

Zohreh Moradi Roodmajani[1], Parvaneh Abrishamchi[1,*], Tayebeh Radjabian[2], Hassan Porsa[3] -*1. Department of Biology,*

Faculty of Science, Ferdowsi University of Mashhad, Mashhad, Iran, 2. Department of Biology, Faculty of Basic Science, Shahed University, Tehran, Iran, 3. Department of Legumes, Research Centre for Plant Sciences, Ferdowsi University of Mashhad, Mashhad, Iran. E-mail: abrisham@um.ac.ir

Salvia abrotanoides (Kar.) Sytsma is a shrubby and perennial species of Lamiaceae family and its numerous biological and medicinal properties are associated with the presence of several types of phenolic compounds in plant organs. The amount and type of plant secondary metabolites are affected byenvironmental stresses and biochemical responses of plants to the stressful conditions. In the present study, the amount of phenolic compounds in leaves, flowers and roots of three populations of *Salvia abrotanoides*,scattered in different regions (Haroonyeh, Hezar Masjed and Joghri) of Khorasan Razavi province, wasmeasured, and Pearson coefficient of correlation was determined between rainfall)as an environmental factor) and amount of phenolic metabolites. After sampling at the flowering stage, methanolic extracts ofdifferent plant organs were prepared by sonication method, and the total contents of phenols, flavonoids and phenolic acids were measured by spectrophotometry. Results showed that the content of phenolic compounds was significantly ($P \leq 0.05$) affected by the population and organ type. The greatest amounts of three groups of phenolic compounds were obtained from the flowers. The highest (3041 mg/100g DW) and the lowest (307 mg/100g DW) contents of total phenols and the maximum (1550 mg/100g DW) and minimum (209 mg/100g DW) values of total phenolic acids were observed in the flower of Haroonyeh and the root of Joghri populations, respectively. Flowers of Haroonyeh population possessed the highest level of total flavonoids with the value of 354 mg/100g DW, while the roots of this population contained the least amount (112 mg/100g DW) of flavonoids. Pearson correlation analysis showed a significant negative correlation ($-0.743 < r < -0.915$) between rainfall and amount of all studied compounds. Haroonyeh population, due to the production of higher amounts of flavonoids and phenolic acids, can be considered as a good candidate for scientific and applied researches related to herbal pharmaceutical products.

Keywords: *Salvia abrotanoides*, Population, Flavonoids, Phenolic acids

بیست و یکمین کنگره ملی و نهمین کنگره بین المللی زیست شناسی ایران
21th National & 9th International Congress on Biology

مقایسه پروفایل اسانس مریم گلی روسی-خزری در رویشگاه‌های متفاوت استان خراسان رضوی

زهره مرادی رودمعجنی[1]، پروانه ابریشم چی[1*]، طیبه رجبیان[2]، حسن پرسا[3]

۱. دانشجوی کارشناسی ارشد، گروه زیست‌شناسی، دانشکده علوم، دانشگاه فردوسی مشهد، مشهد، ایران

۱. دانشیار فیزیولوژی گیاهی، گروه زیست‌شناسی، دانشکده علوم، دانشگاه فردوسی مشهد، مشهد، ایران

۲. دانشیار فیزیولوژی گیاهی، گروه زیست‌شناسی، دانشکده علوم پایه، دانشگاه شاهد تهران، ایران

۳. کارشناس ارشد پژوهشی، گروه پژوهشی بقولات، پژوهشکده علوم گیاهی دانشگاه فردوسی مشهد، مشهد، ایران

ایمیل نویسنده مسئول: abrisham@um.ac.ir

مریم گلی روسی-خزری (*Salvia abrotanoides* (Kar.) Sytsma)، گونه‌ای چندساله از تیره نعناعیان (*Lamiaceae*) است که برخی خواص دارویی آن، با ترکیبات موجود در اسانس، ارتباط دارد. مطالعه حاضر، مقدار و اجزای سازنده اسانس را در برگ و گل سه جمعیت گیاه، که در مناطق متفاوت (هارونیه، هزار مسجد و جغری) از استان خراسان رضوی رویش دارند، بررسی نمود. استخراج اسانس به‌روش تقطیر با آب، شناسایی اجزای آن، توسط GC-MS و خوشه‌بندی داده‌ها به روش UPGMA انجام شد. بیشترین (۲/۰۴٪) و کمترین (۱/۷۰٪) مقدار اسانس، به‌ترتیب مربوط به گل جمعیت هارونیه و برگ جغری بود. تعداد ۳۵ ترکیب مختلف، در اسانس برگ و گل همه جمعیت‌ها، شناسایی شدند و در تمام موارد، سهم مونوترپن‌های اکسیژنی (۶۳/۸۲٪-۴۸/۰۵٪) بیش‌تر از مونوترپن‌های هیدروکربنی (۳۹/۶۳٪-۱۸/۹۱٪) بود. اسانس برگ، سسکویی‌ترپن‌های هیدروکربنی (۸/۱۶٪-۳/۷۷٪) بیشتری در مقایسه با سسکویی‌ترپن‌های اکسیژنی (۶/۵۴٪-۲/۹۲٪) داشت (به‌جز جمعیت هزارمسجد) و در اسانس گل (به‌جز جمعیت جغری)، عکس این حالت مشاهده شد. دلتا -۳-کارن، ۱و ۸ سینئول و کامفور در برگ غالب بودند و در گل، علاوه بر این ترکیبات، آلفا-پینن، بورنئول و بورنیل استات نیز فراوان بودند. ترکیب ۱و ۸ سینئول، حدود یک چهارم اجزای اسانس همه نمونه‌ها را تشکیل داد. بورنیل استات برگ جمعیت جغری (۵/۹۷٪) بیش‌تر از جمعیت‌های هارونیه و هزارمسجد (۵٪>) بود. حضور آلفاکوپائن در گل، منحصر به جمعیت جغری بود. در آنالیز خوشه‌بندی، جمعیت‌ها بر اساس پروفایل متفاوت اسانس برگ و گل، از یکدیگر متمایز شدند. جمعیت‌های هزارمسجد و جغری در یک خوشه مشترک قرار گرفتند که حاکی از شباهت فیتوشیمیایی آنان و تفاوتشان با جمعیت هارونیه بود.

کلمات کلیدی: اسانس، جمعیت، کروماتوگرافی گازی-طیف سنجی جرمی، *Salvia abrotanoides* (Kar.) Sytsma.

بیست و یکمین کنگره ملی و نهمین کنگره بین المللی زیست شناسی ایران
21th National & 9th International Congress on Biology

A comparative study of essential oil profile of *Salvia abrotanoides* (Kar.) Sytsma in different habitats of Khorasan Razavi province

Zohreh Moradi Roodmajani[1], Parvaneh Abrishamchi[1*], Tayebeh Radjabian[2], Hassan Porsa[3]

1. Master student and Associate Professor of plant physiology, Department of Biology, Faculty of Science, Ferdowsi University of Mashhad, Mashhad, Iran.

2. Associate Professor of Plant Physiology, Department of Biology, Faculty of Basic Science, Shahed University, Tehran, Iran.

3. Researcher (MSc.), Department of Pulses, Research Centre for Plant Sciences, Ferdowsi University of Mashhad, Mashhad, Iran.

[*]Corresponding Author's email: abrisham@um.ac.ir

Salvia abrotanoides (Kar.) Sytsma is a perennial species of the *Lamiaceae* family containing medicinal properties which are related to its essential oil (EO) composition. Present study was aimed to determine the amount and profile of EOs in the leaves and flowers of plant populations, grown in three different areas (Harooniyeh, Hezarmasjed and Joghri) of Khorasan Razavi province. Essential oil extraction and identification of its components were performed by water distillation and GC-MS technique, respectively. Data clustering was done by UPGMA method. The highest (2.04%) and lowest (1.70%) contents of EO were found in the flowers of Harooniyeh and leaves of Joghari populations, respectively. Thirty-five compounds were identified in the EO of leaves and flowers of all populations, and in all cases, oxygenated monoterpens (63.82%-48.05%) were higher than hydrocarbon monoterpenes (18.91%-39.63%). In leaves, the level of hydrocarbon sesquiterpenes (3.77%-8.77%) was higher than oxygenated sesquiterpenes (2.92%-5.54%)(except Hezarmasjed population), but it was opposite in flowers (except Joghri population). Camphor, δ-3-carene and 1,8-cineole were predominant in the leaves, while flowers are also rich in α-pinene, borneol and bornyl acetate. In all samples, 1,8-cineole composed about a quarter of EO constituents. Bornyl acetate was higher in leaves of Joghri population (5.97%) compared to Harooniyeh and Hezarmasjed populations (<5%). Alpha-copaene was only determined in the flowers of Joghri population. The examined populations were distinguished based on the clustering analysis of EO constituents of leaves and flowers. Hezarmasjed and Joghari populations were located in a same group and Harooniyeh population was placed in an independent group.

Keywords: essential oil, GC-MS, population, *Salvia abrotanoides* (Kar.) Sytsma.