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GC-MS ANALYSIS OF YOYO AND RUZU BITTERS AND HISTOPATHOLOGICAL AND HEMATOLOGICAL EFFECT OF CO-ADMINISTRATION WITH ANTIDIABETICS IN ALLOXAN INDUCED DIABETES WISTAR RATS.

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Abstract:

The use of both herbal and Orthodox medicines together without prescription is now becoming a rampant practice among patients without knowing the side effects of the interaction. This study is aimed at determining the constituent compounds in Yoyo and Ruzu bitters and its effect in co-administration with antidiabetic agents. Nine groups of five (5) rats each were all induced with diabetes (with exception of the control group) and treated with antidiabetic agents Metformin, Glibenclamide and herbal bitters Ruzu and Yoyo bitters each. The rest of the groups received combination of one antidiabetic with either of the bitters i.e. (metformin+ yoyo and glibenclamide+ yoyo) and vice versa for a period of 14 days. A GC-MS analysis was also performed on the herbal bitters. The GC-MS profile identified the presence of 77 phytochemical compounds in Yoyo and 25 in Ruzu bitters with Squalene (18.6235%) and 9-12 Octadecadienoic acid (79.0619%) as the most abundant phytochemicals respectively with powerful antioxidant properties. The glucose level decreases from day zero to day fourteen after co-administration of the bitters with the antidiabetic agents. Group VI (Met + Ruzu bitters), group VII (Met + Yoyo bitters), group VIII (Glib + Ruzu bitters) and group IX (Glib + Yoyo bitters) with glucose level of 21.02±4.05 mmol/l at day zero and 8.98±6.96 mmol/l at day 14, 20.66±2.70 mmol/l at day zero and 6.1±3.57 mmol/l at day 14, 17.32±11.80 mmol/l at day zero and 3.1±2.24 mmol/l at day 14, 29.18±5.19 mmol/l at day zero and 7.96±8.28 mmol/l at day 14, respectively. Those groups receiving metformin and glibenclamide alone have glucose levels of 11.03±8.78 mmol/l and 10.02±8.87 mmol/l respectively. This sharp drop in glucose level when the antidiabetic drugs were co-administered with the bitters shows a synergistic effect of the two. Histopathological assay of the organs of group VI and VII shows most improved cell state. The use of herbal bitters in co-administration with antidiabetic is proven to be very effective as a hypoglycemic agent considering also its rejuvenating effect on the organs assayed.

Keywords: Ruzu, Yoyo, Metformin, Glibenclamide and GC-MS

RAPID AND NOVEL GOLD NANOPARTICLE-BASED COLORIMETRIC ASSAY FOR DETECTION OF BLUETONGUE VIRUS

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Abstract:

Bluetongue (BT) is a non-contagious, vector-borne viral disease of small and wild ruminants and occurs in several parts of the world. The etiological factor is BT virus belonging to the family Reoviridae and genus Orbivirus. The vectors responsible for the transmission of BT virus are species of flies belonging to the genus Culicoides. Bluetongue virus (BTV) is a significant threat to livestock worldwide, necessitating the development of rapid and sensitive diagnostic methods. Here, we introduce a novel gold nanoparticle-based colorimetric assay for the detection of BTV. This assay exploits the distinctive optical properties of gold nanoparticles to detect viral particles through interaction of gold nanoparticles with the Bluetongue virus-specific oligonucleotides when they are in a free state and not hybridized to the complementary sequence of Bluetongue viral RNA. This causes them to resist aggregation even when they are subjected to the aggregating salt NaCl. The color change reaction remains red, which is the original color of gold nanoparticles. By employing BTV-specific antibodies conjugated to gold nanoparticles, the presence of BTV can be visually identified via color changes within minutes. In the presence of Bluetongue viral RNA, the BTV-specific oligonucleotides probe get hybridized with the complementary sequences of Bluetongue viral RNA, thus rendering them unavailable to bind to the surface of gold nanoparticles. Hence, the gold nanoparticles get aggregated as they are subjected to the aggregating salt NaCl, resulting in a color change reaction for the positive samples. Validation using clinical samples demonstrates the assay's sensitivity and specificity, highlighting its potential as a rapid and cost-effective diagnostic tool for BTV detection in veterinary settings. This innovative approach offers promise for early detection and surveillance of BTV outbreaks, facilitating timely intervention measures to safeguard livestock health and agricultural economies.

Keywords: Bluetongue virus, gold nanoparticles, colorimetric assay, rapid detection, veterinary diagnostics