

عنوان المشروع باللغة العربية	التأثير العلاجي لحبوب اللقاح لبعض التأثيرات السمية العصبية المستحثة في الفئران بعد تعرضها لميثيل الزئبق قبل الولادة
عنوان المشروع باللغة الإنجليزية	Therapeutic potency of bee pollen against neurotoxic effects induced by prenatal exposure to methylmercury
المشرف الرئيس	عبير عبد القادر الغنوشي
التخصص الدقيق للمشرف الرئيس	علم الانزيم و المؤشرات الحيوية
المشرف المساعد	لا يوجد
المدة المتوقعة لإنجاز البحث منذ الحصول على موافقة عمادة الدراسات العليا	شهر 12
Abstract or synopsis of the proposal (200 words or less):	<p>There is an increasing concern about neurological deficits in humans. Environmental contaminants have been proposed as possible causes of learning and emotional disturbances at young age, and neurodegenerative diseases in later life (Landrigan et al., 2005). Methylmercury (MeHg) is known to be an environmental neurotoxicant potentially causing neuropsychological disorders in humans (Gilbert and Grant-Webster, 1995). Furthermore, epidemiological and experimental studies have clearly shown that the developing nervous system is particularly vulnerable to MeHg toxicity. Severe neurotoxic effects of prenatal exposure to high doses of MeHg were established in humans after MeHg disasters in Japan and Iraq (Amin-Zaki et al., 1979; Harada, 1995) and confirmed in animal studies (Burbacher et al., 1990; Bradford et al., 2015). Later, developmental exposure to low doses of MeHg contained in seafood was found to be a risk factor for cognitive disorders (e.g., memory, attention, and language problems) in children and adolescents in the fish-eating population of the Faroe Islands (Debes et al., 2006). This fact raised researchers interest in studying effects of prolonged low-dose exposure in animal models, representing a chronic pattern of exposure in humans (Bradford et al., 2015; Onishchenko et al., 2007). Bee pollen is a natural product that demonstrates antifungal, antimicrobial, anti-inflammatory, and immunostimulating effects (Almaraz-Abarca et al., 2004). It is a rich source of fat-soluble as well as water-soluble vitamins, amino acids, lipids, flavinoids, vitamins and micronutrients. Bee pollen is known to have detoxification activity (such as heavy metals and drugs) and anti-inflammatory mechanisms through the inhibition of the activities of cyclooxygenase and lipoxygenase as enzymes responsible for the conversion of arachidonic acid into toxic compounds as prostaglandin and leukotrienes as inducers of acute and chronic inflammatory conditions in different tissues (Eraslan et al., 2009; Pascoal et al., 2014). Recently, Komosinska-Vassev et al. (2015) suggested that apitherapeutic mechanism of pollen is attributed to its antimicrobial activity and potency to induce regeneration of damaged tissues. Based on the fact that oxidative stress, neuroinflammation, excitotoxicity, impaired detoxification capacity, and microbial imbalance are all recognized as etiological mechanisms related to neurological disorders (El-Ansary et al., 2011 & 2012), it will be</p>

	interesting to investigate the therapeutic effects of bee pollen against the neurotoxic effects of MeHg in neonatal male albino rats, through the measurement of selected biochemical parameters.
Hypothesis or scientific justification of the proposal	Thanks to its antifungal, antimicrobial, anti-inflammatory and immunostimulating effects, natural bee pollen could ameliorate brain intoxication associated with neurological disorders and induced by prenatal exposure to fairly low dose of MeHg.
Specific objectives	<ol style="list-style-type: none"> 1. Study of MeHg neurotoxicity through the measurement of selected biochemical parameters related to brain function and representing oxidative stress, neuroinflammation, and excitotoxicity. 2. Evaluate the therapeutic efficacy of pollen grain in improving the toxic effects of MeHg, through the measurement of all the suggested biochemical parameters.
Methodology & Major Techniques to be used	<p>Pregnant dams will receive MeHg (CH₃HgOH) at the dose of 0.5 mg/kg/day via drinking water from gestational day 7 till day 7 after delivery. MeHg concentration in the drinking water will be adjusted to keep daily dose of exposure at the level of 0.5 mg/kg bw, resulting in a variation from 1.6 to 3.9 mg/l with median concentration of 2.3 mg/l. Control females will receive tap water. The biochemical assays of the present study will be performed on forty young (approximately 28 days old) male Wistar albino mice assigned to four groups, each consisting of 10 pups as described below:</p> <ol style="list-style-type: none"> 1. Group I: Control group 2. Group II: MeHg -exposed group (Delivered by MeHg -treated female dams) 3. Group III: Pollen-treated group 4. Group IV: MeHg treatment followed by pollen <p>At the end of the experiment, brain samples will be collected and kept at -80°C until further use. Later, biochemical analysis will be performed in brain homogenates of neonatal including measurement of lipid peroxidation, vitamin E, glutathione (GSH), catalase, creatine kinase and lactate dehydrogenase. In addition, glutamate, serotonin and IFNγ will be measured using an ELISA kits. Moreover, phospholipids separation will be performed using a Kaneur Maxi Star HPLC system. Data statistical analysis will be performed using one way analysis of variance (ANOVA).</p>
Availability of Samples	NO
If the answer is no, kindly justify	
Availability of Chemicals	NO
If the answer is no, kindly justify	
Availability of Instruments	YES
Availability of Ethical Approval (if needed)	NO

Recent References

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