PDF - TEACHING STUDENTS ABOUT BIODIVERSITY BY STUDYING THE CORRELATION BETWEEN PLANTS & ARTHROPODS - researchcub.infoBiodiversity is anecological buzz-word that has garnered a great deal of attention for the pastseveral decades. The main focus has been on human effects on biodiversity.Humans mainly affect biodiversity directly through development, which decreaseswildlife habitat (Dodd, 1987; Greene, 1997), or indirectly through habitatfragmentation, introduction of exotic species, or alteration of natural cycles(e.g., suppression of natural fires; McClain 8z Anderson, 1990; Owens ST Cole,2003). Much attention has been given to human impacts on biodiversity and manylessons about this topic have been developed for the classroom (Kishbaugh,2002; Almeida et al., 2006). While biodiversity curricula for the classroomhave been inventive and noteworthy, students first need an introduction tobiodiversity, including an introduction to the concept, common ecological termsoften associated with biodiversity, factors that may affect biodiversity of aparticular taxon, and ways of measuring biodiversity. Teachers face thechallenge of introducing this concept in an authentic way which students canapply to their surroundings. This can be especially challenging in urbanenvironments which are human-centered habitats and often low in green spacesand diversity. On Earth there is a huge diversity of arthropods, many of whichare highly adaptive and able to exploit virtually every terrestrial habitat.Because of their prevalence even in urban environments, they make an excellentmodel system for any life science class. Since plants also exploit virtuallyevery terrestrial habitat, studying the relationship between plants and insectsis accessible to all classrooms. The relationship between plants and arthropodsis worthy of investigation because the diversity of arthropods, especiallyinsects, exploded when angiosperms evolved. Insects use plants for food, butplants also increase habitat space and thus, trophic complexity. Studying therelationship between plants and arthropods will help students understand thatorganisms among different taxa are interconnected. Two components ofbiodiversity are richness (i.e., number of species) and abundance (i.e., numberof individuals of each species or taxa). The objective of this project is forstudents to investigate how plant richness affects insect biodiversity (i.e.,richness and abundance across taxa). The plant community directly affectsarthropod abundance and richness, so biodiversity of arthropods should bepositively correlated to plant richness (Siemann et al., 1998). In urbanenvironments, the plant community is fragmented and often represented by alimited number of species. We developed this project in an urban environmentwith middle school students to demonstrate how arthropod biodiversity caneasily be increased by simple habitat modifications to their yards. Workingoutside the classroom in students' backyards is the sort of authentic "hook" weneed as teachers to snare our students' attention and engage in real learning.Thus, we developed a simple experimental protocol for studying biodiversitythat will allow you and your students to determine the diversity of arthropodsin various urban habitats. The project is easy to perform, took only two43-minute class periods, one for an introduction and another to sort samplesand enter data into spreadsheets, and, as you will see in the discussion thatfollows, it can be modified to apply to multiple grade levels. We also found itto be an effective learning experience for the students, and their level

ofmotivation and enthusiasm was very high. Materials & Methods Students weregiven a pre-activity quiz to assess their knowledge of ecological termsassociated with this lesson (Table 1). Following this, we discussed the termson the quiz, demonstrated how to measure plant richness and collect arthropods,and gave students the necessary packet of materials. The packet of materialsincluded one plastic yellow bowl (Solo Cup Company, Urbana, IL), a one-meterlong piece of string, an instruction and plant data sheet (Table 2), and aplastic container with a lid (some students used peanut butter jars or othercontainers from home).

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