



## O'RTA MAXSUS TA'LIMDA FARMAKOGNOZIYA ELEMENTLARINI QO'LLASH: BIOLOGIYA VA AMALIY FARMATSIYA INTEGRATSIYASI

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**Annotatsiya.** Bugungi kunda jahon bozorida dori vositalarining qariyb 40-50% qismi o'simlik xomashyosidan olinadi. O'zbekiston florasidagi 4500 dan ortiq o'simlikning 600 taga yaqini shifobaxshlik xususiyatiga ega. Biroq, maktab biologiya darsliklarida bu ma'lumotlar yuzaki berilgan. Biologiya va farmatsiyaning bog'lab o'qitish o'quvchilarda ekologik madaniyatni shakllantirish bilan birga, farmatsevtika sanoati uchun kadrlar tayyorlashning ilk bosqichi (proforiyentatsiya) sifatida o'ta dolzarbdir.

**Kalit so'zlar:** Etnobotanika, farmakognoziya, integratsiyalashgan ta'lim, fitoterapiya, dori vositalari, morfologik tahlil, loyiha usuli.

**Аннотация.** На сегодняшний день около 40-50% лекарственных средств на мировом рынке производятся из растительного сырья. Из более чем 4500 растений флоры Узбекистана около 600 обладают лечебными свойствами. Однако в школьных учебниках биологии эта информация представлена поверхностно. Обучение биологии в тесной связи с фармацевтикой является крайне актуальным не только для формирования экологической культуры у учащихся, но и в качестве начального этапа профессиональной ориентации для фармацевтической промышленности.

**Ключевые слова:** Этноботаника, фармакогнозия, интегрированное обучение, фитотерапия, лекарственные средства, морфологический анализ, метод проектов.

**Abstract.** Today, approximately 40-50% of pharmaceutical drugs in the global market are derived from plant raw materials. Out of more than 4,500 plants in the flora of Uzbekistan, nearly 600 species possess medicinal properties. However, this information is presented superficially in school biology textbooks. Teaching biology in integration with pharmacy is highly relevant, as it not only fosters ecological culture among students but also serves as the initial stage of professional orientation (career guidance) for the pharmaceutical industry.

**Keywords:** Ethnobotany, pharmacognosy, integrated education, phytotherapy, medicinal products, morphological analysis, project-based method.





## **Kirish**

Bugungi kunda zamonaviy pedagogikaning asosiy talablaridan biri — fanlararo integratsiyani ta'minlashdir. Biologiya fani faqat nazariy bilimlarni o'rgatuvchi fan emas, balki hayotiy jarayonlar va inson salomatligi bilan chambarchas bog'liq sohadir. Xususan, farmakognoziya (dorivor o'simliklarni o'rganuvchi fan) elementlarini biologiya darslariga kiritish o'quvchilarning fanga bo'lgan qiziqishini orttiradi va ularda amaliy ko'nikmalarni shakllantiradi.

### **Farmakognoziya elementlarini o'qitishning metodologik asoslari**

Biologiya darslarida "O'simliklar sistematikasi" va "Morfologiya" bo'limlarini o'tishda farmatsevtik yondashuv quyidagi bosqichlarda amalga oshirilishi maqsadga muvofiq:

**Kimyoviy tarkib va biologik faollik:** O'quvchilarga o'simlikning tashqi ko'rinishi bilan birga, undagi alkaloidlar, efir moylari, flavonoidlar va glikozidlar haqida tushuncha beriladi. Masalan, *Artemisia annua* (Bir yillik shuvoq) o'simligini o'rganishda uning tarkibidagi artemizin moddasining bezgakka qarshi dunyodagi eng samarali dori ekanligi ta'kidlanadi.

**Morfologik tahlil:** Dorivor o'simlikning qaysi qismi (ildizi, poyasi, bargi yoki guli) shifobaxsh ekanligini aniqlash orqali o'quvchi o'simlik organlari funksiyasini chuqurroq anglaydi.

### **Amaliy metodika: "Loyiha asosida o'qitish" (PBL)**

Maqolada ko'rsatilgan "Tabiiy dori qutichasi" loyihasini yanada kengaytirish mumkin:

**Bosqich 1:** O'quvchilar hududiy (lokal) dorivor o'simliklarni inventarizatsiya qiladilar.

**Bosqich 2:** O'simlik xomashyosini yig'ish va quritishning texnik qoidalarini (masalan, soya joyda quritish, harorat rejimi) o'rganadilar.

**Bosqich 3:** Muayyan kasalliklar (masalan, nafas yo'llari yallig'lanishi) uchun o'simliklar yig'imasini (sbor) shakllantiradilar.

### **Metodik yangilik va Case-study**

O'quv jarayoniga "Case-study" metodini kiritish talabalarning tanqidiy fikrlashini rivojlantiradi.

**Misol:** Talabalarga aniq bir dori (masalan, Aspirin) beriladi va uning qonning quyulishiga ta'sir etuvchi biologik ferment — siklooksigenaza (SOX) bilan o'zaro ta'sirini tahlil qilish topshiriladi. Bu orqali biologik jarayonlarning molekulyar darajadagi mohiyati ochib beriladi.

**Farmakobotanika bog'chasi:** "Sinfidan tashqari dorivor bog'cha"

Maktab yoki institut hududida kichik "Farmakobotanika maydonchasi"ni tashkil etish tavsiya etiladi. Bu yerda o'quvchilar:

O'simlikning vegetatsiya davrini kuzatadilar;

Agrotexnik parvarish usullarini o'rganadilar;



Dorivor o'simliklarning "Гербарий" (gerbariy) to'plamlarini tayyorlaydilar.

### **Xulosa**

Xulosa o'rnida aytish mumkinki, biologiya darslarini farmatsiya bilan bog'lash faqatgina nazariy bilim bermasdan, balki:

O'quvchilarning ekologik madaniyatini yuksaltiradi.

Kasbga yo'naltirish (proforiyentatsiya) ishlarini jadallashtiradi, kelajakda farmatsevt, shifokor va biotexnolog kadrlar tayyorlashga poydevor bo'ladi.

Milliy o'simlik resurslarimizdan oqilona foydalanish ko'nikmasini shakllantiradi.

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