UDC 665.58:615.4

Nigmadilova Zhasmin
Grade 10 student
Scientific supervisor: Nurpisova Ainur Mazhitovna
Chemistry teacher
Binom School named after Kadyr Myrza Ali
(Astana, Kazakhstan)

WHAT REPLACES PARABENS? THE PARABEN-FREE LABEL ACROSS PRODUCT CATEGORIES IN THE OPEN BEAUTY FACTS DATABASE

Abstract: Many cosmetic products carry the label "without parabens", but a product still needs a preservative. This study asks in which product categories the label is most common and which preservatives the labelled products contain instead. It uses the open Open Beauty Facts database (export of 16 October 2026, 77,673 products), in which 925 products carry the tag "without paraben". The share of labelled products was compared across categories, and five common preservatives were searched for in the ingredient lists of 864 labelled and 20,622 unlabelled products with readable lists. The label was 8.7 times more frequent in hair and skin products (5.4%) than in all other categories (0.6%), and most frequent on shower gels (10.3%) and shampoos (7.0%); it was almost absent on makeup and never found on perfumes. Sodium benzoate was the clearest replacement: it was listed in 45.0% of labelled products against 28.5% of unlabelled ones, and the difference held after adjusting for category and inside shampoos and shower gels. The apparent excess of phenoxyethanol came from a single brand. No labelled product listed a paraben. A "paraben-free" product is therefore usually preserved with other substances, most often sodium benzoate.

Keywords: cosmetics, parabens, preservatives, sodium benzoate, phenoxyethanol, labelling, open data

Introduction

Water-based cosmetics such as shampoos and creams need preservatives, otherwise bacteria and fungi grow in them during use. For decades parabens were among the most widely used preservatives, but they are also known contact allergens and have been debated for their weak hormone-like activity, which has made "paraben-free" a common marketing claim [1]. Removing parabens does not remove the need for preservation, so a product labelled "without parabens" usually contains another preservative. The European Union, for example, allows benzoic acid and its sodium salt, sorbic acid and its salts, phenoxyethanol and a number of other substances as cosmetic preservatives, each with its own maximum concentration [2].

For a buyer, the label raises two simple questions: on which products does it appear, and what is in those products instead of parabens? These questions can be answered with open data. Open Beauty Facts is a public database in which volunteers record the label, category and ingredient list of cosmetic products from photographs of the packaging [3].

The author chose this topic from five options proposed by her mentor on 4 October 2026, because it connects chemistry with her interest in cosmetology. Before any numbers were computed she wrote two expectations: on 11 October 2026, that the label would be most frequent on shampoos, and on 12 October 2026, more precisely, that it would be most frequent on hair and skin care products and that parabens would be replaced by phenoxyethanol, sodium benzoate and potassium sorbate. This study tests both.

Materials and Methods

Data. The full export of Open Beauty Facts (file dated 16 October 2026) was downloaded on 16 October 2026; it contained 77,673 products [3]. The database is published under the Open Database License and contains no personal data.

The label. A product was counted as labelled if it carried the label tag "en:without-paraben". This gave 925 products (1.2%). The same label written in other languages without the common tag (for example Portuguese "sem parabenos" or German "ohne Parabene") added 136 products; these were used only as a check and did not change the conclusions.

Categories. Products were grouped by the database's category tags into shampoos, shower gels, body creams, facial creams, soaps and deodorants, into broader groups (hair, face, body) and into comparison groups (makeup, oral care, perfumes, sun care). Of the 925 labelled products, 578 had a category.

Preservatives. Five preservatives named in the plan were searched for in the ingredient text: phenoxyethanol, sodium benzoate, potassium sorbate, methylisothiazolinone (MI) and methylchloroisothiazolinone (MCI). The search used the international ingredient names and their spellings in nine other languages, and ignored claims such as "free of phenoxyethanol". Only products with a readable list were used: 864 labelled and 20,622 unlabelled products. The search was cross-checked against the database's own ingredient parser on 21,382 products; agreement ranged from 86.7% to 99.6%, and almost all disagreements were mentions the parser had missed.

Statistics. Shares are given with Wilson 95% confidence intervals. Groups were compared with the chi-square test (Fisher's exact test for small counts). Because the labelled products are mostly shampoos and shower gels, the preservative comparison was repeated after adjusting for category (Mantel-Haenszel method, 15 strata). Because five preservatives were tested, $p < 0.01$ was used as the threshold for a clear result. The plan of the analysis was written on 13 October 2026 and approved by the author on 14 October 2026, before the results were seen.

Results

Where the label appears. The label was concentrated in hair and skin care (Figure 1). Among products with a category, 5.4% of hair and skin products (434 of 8,060) were labelled, against 0.6% (144 of 23,369) of all other products, 8.7 times more often (chi-square 754.8, $p < 0.001$). The highest shares were on shower gels (10.3%, 110 of 1,071) and shampoos (7.0%, 153 of 2,187), followed by body creams (6.2%) and facial creams (5.1%). Soaps (3.2%) and deodorants (1.9%) were low although they are body products, makeup had 0.6% and perfumes none of 1,059. The ranking was the same when only France and Germany were considered and when the largest brand was removed.

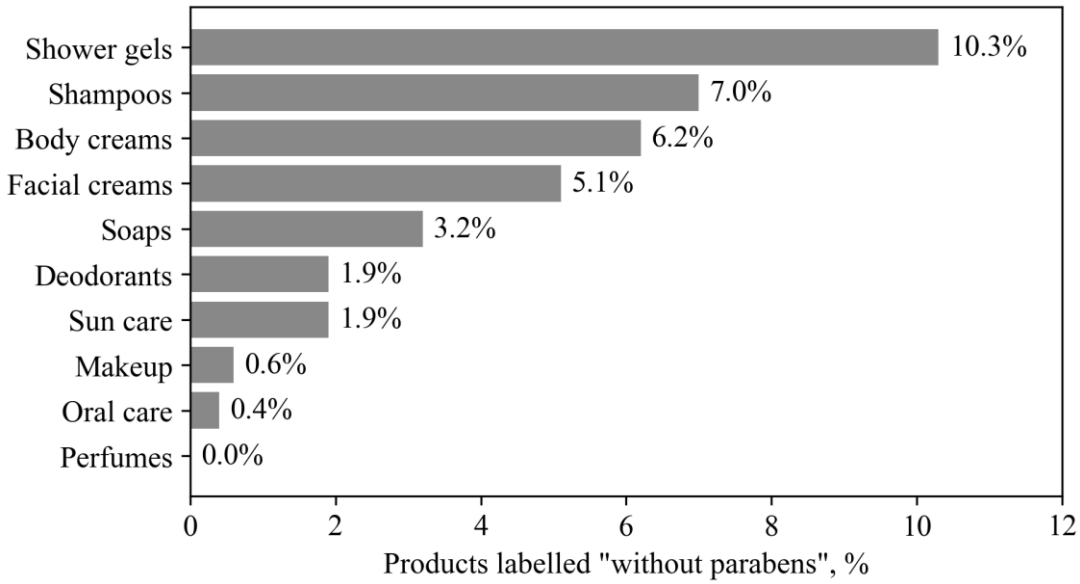


Figure 1 - Share of products carrying the label "without paraben" in each category, Open Beauty Facts, 16 October 2026

Where the products come from. The labelled products come mostly from Europe: 806 of the 925 are sold in France or Germany, and one German drugstore brand, Balea, accounts for 343 of them. Of the 90 products in the database tagged as sold in Kazakhstan, none carries the label.

What replaces parabens. Table 1 compares the five preservatives in labelled and unlabelled products. Sodium benzoate was listed in 45.0% of labelled products against 28.5% of unlabelled ones; the difference remained after adjusting for category (odds ratio 1.39, $p < 0.001$) and after removing Balea (1.69, $p < 0.001$). It also held inside single categories: among shampoos 85.2% of labelled products contained sodium benzoate against 68.1% of unlabelled ones, among shower gels 91.0% against 79.8%.

Table 1 - Preservatives in products with and without the paraben-free label (OR: Mantel-Haenszel odds ratio adjusted for category)

Preservative	**Labelled (n = 864)**	**Not labelled (n = 20,622)**	**Raw p**	**Adjusted for category, OR (p)**	**Adjusted, without Balea, OR (p)**
Sodium benzoate	45.0%	28.5%	< 0.001	1.39 (< 0.001)	1.69 (< 0.001)
Phenoxyethanol	31.4%	23.4%	< 0.001	1.50 (< 0.001)	0.68 (0.001)
Potassium sorbate	21.2%	15.0%	< 0.001	1.21 (0.025)	1.16 (0.192)
MI	5.4%	4.9%	0.438	0.70 (0.028)	0.99 (0.957)
MCI	3.4%	4.1%	0.260	0.48 (< 0.001)	0.66 (0.045)
Any of the five	71.6%	49.5%	< 0.001	1.84 (< 0.001)	1.36 (0.005)
Any paraben	0.0%	5.3%	< 0.001		

Phenoxyethanol at first looked more common in labelled products (31.4% against 23.4%), but this came from one brand: 183 of the 343 Balea products contain it, while the other 521 labelled products contain it in only 16.9% of cases. Without Balea, labelled products contained phenoxyethanol less often than comparable unlabelled products (odds ratio 0.68). Potassium sorbate was somewhat more common in labelled products (21.2% against 15.0%), but after adjusting for category the difference did not pass the $p < 0.01$ threshold. MI and MCI were not more common with the label. In 245 labelled products (28.4%) none of the five preservatives was found.

The label and the ingredient lists agreed: none of the 864 labelled products listed a paraben, against 5.3% of unlabelled products.

Discussion

The first part of the author's expectation was confirmed. The label is a feature of hair and skin care, and above all of rinse-off products such as shower gels and shampoos; her first guess, shampoos, was second only to shower gels. The second part was confirmed for sodium benzoate, only weakly for potassium sorbate, and not for phenoxyethanol, whose apparent excess came from one large brand. This shows how much one brand can change a result in a crowd-sourced database, and why results should be checked with and without it.

Asked why manufacturers choose sodium benzoate, the author wrote on 16 October 2026 that it is allowed by strict eco-certificates and is one of the cheapest preservatives, quoting seller listings on Alibaba of about 1.5-3 US dollars per kilogram for sodium benzoate against 4-8 dollars for phenoxyethanol. These are sellers' prices rather than a market statistic, and the claim about eco-certificates rests on a supplier's web page and was not checked against the certification standard itself. Her explanation fits the finding that sodium benzoate dominates inexpensive, high-volume rinse-off products such as shampoos and shower gels.

For a buyer, the result means that "without parabens" does not mean "without preservatives": seven in ten labelled products with a readable list contained at least one of the five preservatives, more often than unlabelled products. Whether these replacements are gentler for the skin cannot be judged from ingredient lists.

Limitations. Open Beauty Facts is filled in by volunteers, so categories and ingredient lists are incomplete, and a product can say "paraben-free" on the package without being tagged. The database mostly reflects the French and German markets and cannot describe the market in Kazakhstan. Ingredient lists show which substances are present, not their amounts. The study shows which preservatives labelled products contain today, not that a manufacturer replaced one substance with another.

Conclusion

In the Open Beauty Facts database, the label "without parabens" was found mainly on hair and skin care products (5.4% against 0.6% in other categories), most often on shower gels and shampoos. The clearest substitute for parabens in labelled products was sodium benzoate, present in 45.0% of them against 28.5% of other products, a difference that held within categories. The apparent role of phenoxyethanol was the effect of one brand. As a next step, the author proposes, with data from Kazakhstan, to ask how many people noticed a worse condition of their skin or hair after using "paraben-free" cosmetics, and to compare reviews of products with and without parabens.

Data availability. The Open Beauty Facts export is publicly available at the address in reference [3]; the version used is identified by its date and checksum. The tables and the analysis script are kept by the author's research mentor and are available on request.

Author contributions and use of AI tools. The author chose the topic and the research question from options prepared by her mentors, checked the database herself on three products (7 October 2026), wrote the expectations tested in this paper (11 and 12 October 2026), approved the analysis plan, and wrote the explanation of the choice of sodium benzoate (16 October 2026) and the proposal for further work (22 October 2026). The data were analysed and the English text was drafted by her mentors with the help of an AI assistant (Claude); the author read the final text and confirmed that it describes her part correctly.

Acknowledgements. Product data from Open Beauty Facts (openbeautyfacts.org), contributed by its volunteers.

Conflict of interest. The author declares no conflict of interest.

References:

1. Fransway A.F., Fransway P.J., Belsito D.V., Warshaw E.M. et al. Parabens // Dermatitis. 2019. Vol. 30, No. 1. P. 3-31. DOI: 10.1097/DER.0000000000000429.

2. Regulation (EC) No 1223/2009 of the European Parliament and of the Council on cosmetic products. Annex V: List of preservatives allowed in cosmetic products. URL: https://www.legislation.gov.uk/eur/2009/1223/annex/V (accessed: 27.10.2026).

3. Open Beauty Facts. Open database of cosmetic products. Data export: openbeautyfacts-products.jsonl.gz. URL: https://world.openbeautyfacts.org/data (accessed: 16.10.2026).

МАЗМҰНЫ – СОДЕРЖАНИЕ – CONTENT

ӘЛЕУМЕТТІК-ЭКОНОМИКАЛЫҚ ЖӘНЕ ҚҰҚЫҚ ҒЫЛЫМДАРЫ - СОЦИАЛЬНО-ЭКОНОМИЧЕСКИЕ И ЮРИДИЧЕСКИЕ НАУКИ - SOCIO-ECONOMIC AND LEGAL SCIENCES

Төлегенов Тимур Сейфуллаулы
ДИНАМИКА ТУРИСТСКИХ ПОТОКОВ И ЭФФЕКТИВНОСТЬ ИНФРАСТРУКТУРЫ ТУРКЕСТАНА: ОТ ЭКСТЕНСИВНОГО РОСТА К СМАРТ-УПРАВЛЕНИЮ 12

Alexander Gorevoy
WHICH INEQUALITY STATISTICS SURVIVE AN ADMINISTRATIVE BOUNDARY CHANGE? EVIDENCE FROM KAZAKHSTAN, 2010–2023 16

Rakhimov Djalil
DOES THE SHIFT TO CASHLESS PAYMENTS GO TOGETHER WITH FASTER GROWTH IN HOUSEHOLD CREDIT? EVIDENCE FROM THE REGIONS OF KAZAKHSTAN, 2023-2025 28

Kazhgerey Asan
HOW MANY FOOD BASKETS DOES AN AVERAGE WAGE BUY? WAGES AND FOOD PRICES IN THE 20 REGIONS OF KAZAKHSTAN, 2024-2026 39

Tagimova Alua
WHO WAS LEFT BEHIND? EDUCATION AND FINANCIAL INCLUSION IN KAZAKHSTAN AND THREE CENTRAL ASIAN NEIGHBOURS, 2021-2024 46

Wei Wei, Mynzhanova Gulzhakan, Niyetalina Gaukhar
DIGITAL–PHYSICAL INTEGRATION AND ECONOMIC PERFORMANCE IN INDUSTRIAL INTEGRATED ENERGY SYSTEMS: A SCENARIO-BASED ANALYSIS OF SMART GRID CONTROL, BATTERY ENERGY STORAGE, AND DIGITAL TWINS 53

Xu Fumin, Wei Wei, Ruziyeva Elvira, Moldabekova A.
FROM CULTURAL RESOURCES TO GLOBAL CONSUMER VALUE: THE BRIDGE–IMC MODEL AND THE INTERNATIONALIZATION OF BLACK MYTH: WUKONG UNDER THE BELT AND ROAD INITIATIVE 66

Ibraimkhan Alikhan
WHICH CRIMES CAN A 14-YEAR-OLD BE TRIED FOR? THE LIST IN ARTICLE 15 OF KAZAKHSTAN'S CRIMINAL CODE COMPARED WITH 30 OTHER JURISDICTIONS 82

Yerboluly Madi
DID IMPORTED CARS REALLY GET CHEAPER? CHINESE CARS AND THE AVERAGE CUSTOMS VALUE OF PASSENGER CARS IMPORTED INTO KAZAKHSTAN, 2015-2025 93

Салимбаев Ербол Аманжолович
АНАЛИЗ ИНВЕСТИЦИОННОЙ АКТИВНОСТИ КАК ИНДИКАТОР ИЗМЕНЕНИЙ ПОТЕНЦИАЛЬНОГО СПРОСА НА КОНСАЛТИНГОВЫЕ УСЛУГИ 101

Rambergenov Ramil
REGIONAL NEW-FIRM FORMATION IN UZBEKISTAN AFTER THE 2017 REFORMS: PERSISTENCE IN SCALE, CONVERGENCE IN INTENSITY, AND RECOMPOSITION TOWARD TRADE 109

Abdesh Dinara
FROM A WOMEN'S LEAD TO A MEN'S LEAD: THE GENDER GAP IN DIGITAL PAYMENTS IN KAZAKHSTAN AND THREE CENTRAL ASIAN NEIGHBOURS, 2021-2024 118

Amangeldi Aidana
DID SMALL BUSINESS IN KAZAKHSTAN REALLY SHRINK IN 2026? THE NEW TAX CODE, REGIONAL TAX RATES AND THE FALL IN THE NUMBER OF INDIVIDUAL ENTREPRENEURS 126

Cheng Che
BUILD, BUY, OR PARTNER? ENTRY MODE SELECTION AND RISK GOVERNANCE FOR WIND POWER INVESTMENT IN KAZAKHSTAN **135**

Wang Liang
FROM CAPACITY EXPANSION TO SYSTEM VALUE: COORDINATED DEVELOPMENT OF RENEWABLE ENERGY, GRID FLEXIBILITY AND ENERGY STORAGE IN KAZAKHSTAN **148**

Chen Jun
CONSTRUCTION-PERIOD CREDIT RISK MANAGEMENT FOR LARGE INFRASTRUCTURE PROJECT FINANCE IN KAZAKHSTAN **161**

Alniyaz Danial
HOW MUCH FUEL DOES A HYBRID REALLY SAVE? A SAME-MODEL COMPARISON OF HYBRID AND GASOLINE CARS IN US FUEL ECONOMY **175**

Assem Yergali, Maral Assanova
DIGITAL TRANSFORMATION AND SUSTAINABLE BUSINESS MODEL INNOVATION IN SMALL AND MEDIUM-SIZED ENTERPRISES: A SYSTEMATIC REVIEW OF DYNAMIC CAPABILITIES, VALUE CREATION, AND THE CREDIBILITY GAP IN EMERGING ECONOMIES **182**

Бейбіт Инара Алибекқызы, Едилов Саназар
ВОДА ИЗ ТУМАНА ИЛИ ВОДА ИЗ МОРЯ: ПОРОГОВАЯ СТОИМОСТЬ, ПРИ КОТОРОЙ ТУМАНОУЛОВИТЕЛИ КОНКУРЕНТОСПОСОБНЫ В МАНГИСТАУСКОЙ ОБЛАСТИ **195**

Zhenisbekova Aknur
DID A TENGE DEPOSIT OR THREE KAZAKHSTANI SHARES PROTECT SAVINGS FROM INFLATION? REAL RETURNS OF BANK DEPOSITS, KAZATOMPROM, KEGOC AND KASPI.KZ, 2020-2025 ..... **207**

Абилдаева Аселя
ОРГАНИЗАЦИОННАЯ ГОТОВНОСТЬ ВУЗОВ КАЗАХСТАНА К ВНЕДРЕНИЮ ЭНДАУМЕНТ-ФОНДОВ: КОНЦЕПТУАЛЬНАЯ РАМКА НА ОСНОВЕ ОБЗОРА ЛИТЕРАТУРЫ И АНАЛИЗА ДОКУМЕНТОВ **215**

Yang Juntao
DIGITAL ESG GOVERNANCE AND NEXT-GENERATION DIGITAL COMPETENCY AS DRIVERS OF SUCCESSION IN FAMILY AGRICULTURAL ENTERPRISES: A CONCEPTUAL FRAMEWORK ... **229**

Kairbek Mariya Islamkyzy, Kylbaev Erlan Serikovich
STATE SUPPORT FOR THE DIGITALIZATION OF MANUFACTURING IN THE REPUBLIC OF KAZAKHSTAN: AN ANALYSIS OF ITS COVERAGE OF MARKETING AND SALES ACTIVITIES **242**

Tilep Aiaru
WHEN DID IT EXPORTS TAKE OFF? ICT SERVICE EXPORTS OF KAZAKHSTAN, ARMENIA, GEORGIA AND THREE NEIGHBOURS, 2015-2024 ..... **255**

Anuarbek Murager
DID THE TENGE STOP FOLLOWING OIL? BRENT PRICES AND THE TENGE-DOLLAR RATE BEFORE AND AFTER FEBRUARY 2022 ..... **266**

Kaiyrbek Zhanadil
HOW ACCURATELY CAN OBSERVABLE LISTING DATA ESTIMATE FAIR PRICES FOR USED CARS IN KAZAKHSTAN? A HEDONIC MODEL OF 2,546 ONLINE LISTINGS **276**

Wen Yali
PERCEIVED ORGANIZATIONAL SUPPORT AND TURNOVER INTENTION AMONG KNOWLEDGE WORKERS IN A CHINESE PRIVATE TRAINING INSTITUTION: THE MEDIATING ROLE OF AFFECTIVE ORGANIZATIONAL COMMITMENT **289**

Құрманалиева Дана
ИСТОЧНИКИ ФИНАНСИРОВАНИЯ ИННОВАЦИОННЫХ ПРОЕКТОВ И КРИТЕРИИ ВЫБОРА ФИНАНСОВОЙ МОДЕЛИ **300**

ТЕХНИКАЛЫҚ ҒЫЛЫМДАР - ТЕХНИЧЕСКИЕ НАУКИ - TECHNICAL SCIENCE

Nurmakhan Almira
ADVANTAGES OF FIBER OPTIC COMMUNICATION OVER TRADITIONAL COPPER CABLES **307**

Kozhabai Bereke
SECURITY CHALLENGES IN IOT-BASED TELECOMMUNICATION NETWORKS **315**

Azamatuly Yerassyl
WHY AI-GENERATED CODE FAILS A BENCHMARK: A FAILURE ANALYSIS OF THREE OPEN LANGUAGE MODELS ON 30 HUMANEVAL+ TASKS **324**

Nurzhan Sanzhar
A FEW SHELLS, A FEW OPERATORS: WHERE LOW EARTH ORBIT IS CROWDED IN AN ALTITUDE-INCLINATION MAP OF 16,620 ACTIVE SATELLITES **333**

Askarbek Nurislam
CAN THE WEATHER TELL WHICH DAYS IN ASTANA WILL BE POLLUTED? CLASSIFYING PM2.5 EXCEEDANCE DAYS WITH MACHINE LEARNING AND CHECKING THE DATA AGAINST A GROUND MONITOR **339**

Iliyas Arman
SHOOTING ON THE MOVE: HOW MUCH AIM A ROBOT LOSES BY IGNORING ITS OWN VELOCITY, AND WHETHER A VIRTUAL-TARGET CORRECTION RECOVERS IT **350**

Ануар Әлімжан Бахытжанұлы, Сексенбаева Айша Курманбековна
СРАВНИТЕЛЬНЫЙ АНАЛИЗ СТАНДАРТОВ И МЕТОДИК ОБУЧЕНИЯ КИБЕРБЕЗОПАСНОСТИ: NICE FRAMEWORK, ECSF И ПРАКТИКО- ОРИЕНТИРОВАННЫЕ ТЕХНОЛОГИИ **356**

Mukhamedzhan Yerganat
GROWTH OF GITHUB DEVELOPER COMMUNITIES IN KAZAKHSTAN, UZBEKISTAN AND KYRGYZSTAN, 2020-2026: EVIDENCE FROM THE GITHUB INNOVATION GRAPH **366**

Kashkinov Alden
WHAT DECIDES HOW LONG A LANDER WORKS ON ANOTHER WORLD? SURFACE LIFETIMES OF 55 LANDERS ON THE MOON, VENUS, MARS, TITAN AND SMALL BODIES IN THE GCAT CATALOGUE, 1966-2025 ..... **378**

Kenesbek Miras
HOW MANY HERONIAN TRIANGLES HAVE A GIVEN LONGEST SIDE? A COMPLETE COUNT UP TO 2000 AND THE RIGHT TRIANGLES HIDDEN INSIDE **390**

Amirlan Seitkadyrov, Akezhan Omashev
AUTOMATIC MULTIPLE-CHOICE QUESTION GENERATION USING ARTIFICIAL INTELLIGENCE **401**

Idrissov Amirzhan
WHERE DO SMALL OPEN LANGUAGE MODELS BREAK ON OLYMPIAD MATHEMATICS? DOMAIN, DIFFICULTY AND MODEL SIZE ON OMNI-MATH **410**

Маматаева Рамина Адилгазыевна, Бидуәлі Алмат Алматұлы
ОБЗОР И СРАВНЕНИЕ ПОПУЛЯРНЫХ КРОССПЛАТФОРМЕННЫХ ФРЕЙМВОРКОВ ДЛЯ РАЗРАБОТКИ МОБИЛЬНЫХ ПРИЛОЖЕНИЙ **415**

Қасен Ғауһар Ғалымжанқызы, Алкеева Дана Мирасовна
КОМПЬЮТЕРЛІК КӨРУДІ ПАЙДАЛАНЫП,МЕХАНИКАЛЫҚ ДЕНЕ ЗАҢЫН АНЫҚТАУ АЛГОРИТМДЕРІН ӘЗІРЛЕУ **421**

Khalilzade Seymur Fazil oglu
ASSESSING THE IMPACT OF ELECTRIC VEHICLES ON ENERGY DEMAND IN HIGH-RISE RESIDENTIAL BUILDINGS **434**

Igilikov Adilkhan Igilikovich
PRE-TRAINED REPRESENTATIONS OF PRIOR-ADMISSION HISTORY IMPROVE ONE-YEAR, BUT NOT IN-HOSPITAL, MORTALITY PREDICTION IN ICU PATIENTS WITH CHRONIC DISEASE: A MIMIC-IV STUDY **449**

Nurgali Dias, Nurgali Miras, Akashov Aslan
PREDICTIVE TRAFFIC MANAGEMENT: EXPLORING SOLUTIONS TO TRAFFIC CONGESTION IN ASTANA, KAZAKHSTAN **461**

ПӘНДЕР АРАЛЫҚ ҒЫЛЫМДАР – МЕЖДИСЦИПЛИНАРНЫЕ НАУКИ – INTERDISCIPLINARY SCIENCES

Albiyev Asser
HOW MUCH OF AN ARTICLE COUNT IS HUMAN WORK? DECOMPOSING THE CREATION OF FIVE WIKIPEDIAS, 2010–2025 ..... **467**

Amangeldy Nurbolat
HOW MUCH OF KAZAKHSTAN'S URBAN BUILT STOCK PREDATES ITS SEISMIC CODES, AND WHERE DOES THAT STOCK SIT RELATIVE TO HAZARD? **477**

Torekhan Sabrina
WHERE ALMATY WALKS ITS OWN WAY: INFORMAL SHORTCUTS IN OPENSTREETMAP AND THE DETOURS THEY AVOID **483**

Ailan Salybekova
PARENTAL SUPPORT, PARENTAL CONTROL, STRESS AND EARLY ALCOHOL USE IN ADOLESCENT GIRLS: A NARRATIVE REVIEW WITH A FOCUS ON KAZAKHSTAN **488**

Yerboluly Madi
WHY IS KAZAKHSTAN'S GENDER GAP AT THE TOP OF CHESS SO SMALL? A BIRTH-COHORT COMPARISON ON THE FIDE RATING LIST **496**

Omashev Akezhan
REGIONAL HEALTH AND SOCIAL INDICATOR PATTERNS AND PCA- BASED MORTALITY MODELING IN KAZAKHSTAN, 2011–2024. A TWO- PART EXPLORATORY ECOLOGICAL ANALYSIS **501**

Мадиярова Жанел Биржановна
ДИПФЕЙК ТЕХНОЛОГИЯСЫНЫҢ ҚОҒАМДЫҚ ПІКІРГЕ ЫҚПАЛЫ ЖӘНЕ ОНЫ ҚҰҚЫҚТЫҚ РЕТТЕУ ТӘЖІРИБЕСІ **511**

Bolatov Sanzhar
HOW MUCH DOES KAZAKH SPEECH RECOGNITION LOSE WHEN THE MODEL GETS SMALLER? KAZAKH AGAINST 82 LANGUAGES IN THE PUBLISHED WHISPER RESULTS **521**

Ilya Tsoy
WHO PAYS MORE TOKENS FOR THE SAME SENTENCE? RUSSIAN, KOREAN AND ENGLISH IN FOUR LANGUAGE MODEL TOKENIZERS ON 1,012 FLORES-200 SENTENCES **530**

Assan Ramazan
WHICH NAME DO READERS STILL USE? FORMER NAMES OF RENAMED KAZAKHSTANI CITIES IN RUSSIAN AND KAZAKH WIKIPEDIA PAGE VIEWS, 2015–2026 ..... **543**

Nigmadilova Zhasmin
WHAT REPLACES PARABENS? THE PARABEN-FREE LABEL ACROSS PRODUCT CATEGORIES IN THE OPEN BEAUTY FACTS DATABASE **556**

ӘЛЕУМЕТТІК ЖӘНЕ ГУМАНИТАРЛЫҚ ҒЫЛЫМДАР - СОЦИАЛЬНО-ГУМАНИТАРНЫЕ НАУКИ - SOCIAL SCIENCES AND HUMANITIES

Мұқатаева Айзат Амантайқызы, Стамбекова Жанат Байғазықызы, Слямханова Гүлім Болатқызы, Қызырбек Аяулым Ерболқызы
ЖАСАНДЫ ИНТЕЛЛЕКТ ДӘУІРІНДЕГІ ҒЫЛЫМИ ТАНЫМ: ПОППЕР, КУН ЖӘНЕ ЛАКАТОС ИДЕЯЛАРЫ ТҰРҒЫСЫНАН ТАЛДАУ **561**

Мұқатаева Айзат Амантайқызы, Сапарханова Мадина Төлегенқызы, Окенова Аружан Муратхановна, Тұрсынғазыева Ақерке Ерболатқызы
ШӘКӘРІМ ФИЛОСОФИЯСЫНДАҒЫ ЕРКІНДІК ЖӘНЕ МОРАЛЬДЫҚ ТАҢДАУ МӘСЕЛЕСІ **571**

Komekova Saida
DO UNHAPPY REVIEWERS MIX IN MORE RUSSIAN? STAR RATINGS AND KAZAKH-RUSSIAN CODE-SWITCHING IN 175,002 ONLINE REVIEWS **580**

Zhumagali Yerbol
DOES A BIGGER MODEL CLOSE THE GAP? KAZAKH-LANGUAGE ACCURACY ON KAZAKHSTAN-SPECIFIC VERSUS UNIVERSAL SCHOOL SUBJECTS IN SMALL OPEN-WEIGHT LANGUAGE MODELS **593**

Abdrakhmanova Madina
DOES A MEDAL BUY ATTENTION? WIKIPEDIA VIEWS OF KAZAKHSTAN'S ATHLETES BEFORE AND AFTER THE PARIS 2024 OLYMPIC **597**

ПЕДАГОГИКАЛЫҚ ЖӘНЕ ПСИХОЛОГИЯЛЫҚ ҒЫЛЫМДАР – ПЕДАГОГИЧЕСКИЕ И ПСИХОЛОГИЧЕСКИЕ НАУКИ – PEDAGOGICAL AND PSYCHOLOGICAL SCIENCES

Kaldarbek Mergen
FAMILY OR SCHOOL? SOCIOECONOMIC COMPOSITION AND MATHEMATICS ACHIEVEMENT IN KAZAKHSTAN, PISA 2022 AND 2025 ..... **605**

Zhenis Adilzhan
WHICH OLYMPIAD PROBLEMS DO STUDENTS TAKE TO THE BOARD? CHOICES AND DEFENCES IN THE 8TH-GRADE LEAGUE OF KARAGANDY MATHBATTLES 2026 ..... **612**

Базарбаева Айнур Бектуровна
ДЕТСКИЙ ФОЛЬКЛОР И ПОДВИЖНЫЕ ИГРЫ КАК ИНСТРУМЕНТЫ ФОРМИРОВАНИЯ ОСНОВ ПРАВОВОЙ КУЛЬТУРЫ У ДЕТЕЙ СТАРШЕГО ДОШКОЛЬНОГО ВОЗРАСТА **619**

БИОЛОГИЯ ҒЫЛЫМДАР - БИОЛОГИЧЕСКИЕ НАУКИ - BIOLOGICAL SCIENCES

Bazhenova Diana
GROWTH DYNAMICS OF STERLET (Acipenser ruthenus L.) REARED IN A RECIRCULATING AQUACULTURE SYSTEM **622**

ТУРИСТИЧЕСКИЕ И СПОРТИВНЫЕ НАУКИ - ТУРИСТІК ЖӘНЕ СПОРТ ҒЫЛЫМДАРЫ - TOURISM AND SPORTS SCIENCES

Төлеп Жазира Маратқызы
ГАСТРОНОМИЯЛЫҚ ФЕСТИВАЛЬДЕРДІҢ ТУРИСТІК ДЕСТИНАЦИЯ ТАРТЫМДЫЛЫҒЫН ҚАЛЫПТАСТЫРУДАҒЫ РӨЛІ МЕН ДАМУ ҮРДІСТЕРІ **629**

ЕСТЕСТВЕННЫЕ НАУКИ - ЖАРАТЫЛЫСТАНУ ҒЫЛЫМДАРЫ - NATURAL SCIENCES

Нургельдина Асель Ермековна, Серикбаева Жанерке Алимжановна
ШЕКАРАСЫЗ ФИЗИКА: ӘР ЕЛДЕГІ ФИЗИКАЛЫҚ БІЛІМДІ САЛЫСТЫРУ **636**

Torekhan Sabrina
IS ALMATY A 15-MINUTE CITY? WALKING ACCESS TO SIX EVERYDAY PLACES FROM 170,838 BUILDINGS IN THE CITY'S EIGHT DISTRICTS **643**

Онгарбек Махабат Саятқызы
CU-PT ЖӘНЕ NI-PT ҚОРЫТПАЛАРЫНЫҢ ФИЗИКАЛЫҚ ҚАСИЕТТЕРІНЕ РЕТТЕЛУ ҮДЕРІСІНІҢ ЖӘНЕ ҚҰРЫЛЫМДЫҚ ӨЗГЕРІСІНІҢ ӘСЕРІН РЕТТЕУ **651**

Нургельдина Асель Ермековна, Әбдуәлі Мерей Ералықызы
ҮЙКЕЛІС КҮШІНІҢ ТАБИҒАТТАҒЫ РӨЛІ **659**

Ossipov Vladislav
MANY REPORTS, WEAK EVIDENCE? EVIDENCE LEVELS FOR MICROBIAL PLASTIC DEGRADATION IN THE 2,535 RECORDS OF PLASTICDB **664**

Нургельдина Асель Ермековна, Кабдулаева Жанель Батырбековна
РАДИОАКТИВТІЛІК. АЛЬФА, БЕТА, ГАММА СӘУЛЕЛЕРІНІҢ ТЕГІ МЕН ЗАҢДЫЛЫҚТАРЫ. ЯДРОЛЫҚ РЕАКЦИЯ ЖӘНЕ ЖАРТЫЛАЙ ЫДЫРАУ ПЕРИОДЫ **673**

Kashkinov Alden
DOES AN ACTIVE SUN BRING SATELLITES DOWN SOONER? SOLAR ACTIVITY AND THE RE-ENTRY OF UNCONTROLLED OBJECTS IN LOW EARTH ORBIT, 1990-2025 ..... **678**

Demin Mark
HOW MUCH LESS OXYGEN CAN THE WARMING CASPIAN SEA HOLD? THE LOSS OF OXYGEN SOLUBILITY IN THE NORTHERN, MIDDLE AND SOUTHERN CASPIAN, 1982-2022 ..... **684**